

DENVER FRONT RANGE STUDY DIOXINS IN SURFACE SOIL

Study 2: Characterization of Dioxins, Furans and PCBs In Random Soil Samples Collected from The Rocky Mountain Arsenal

July 2001



Prepared for and jointly by:

U.S. Environmental Protection Agency, Region 8
Denver, Colorado

working in cooperation with:

Remediation Venture Office of the Rocky Mountain Arsenal
and
Colorado Department of Public Health and Environment

with technical support by:

Syracuse Research Corporation
Denver, Colorado

and

Gannett Fleming, Inc.
Denver, Colorado

TABLE OF CONTENTS

1.0	INTRODUCTION	<u>1</u>
1.1	Site Description	<u>1</u>
1.2	Definition of Dioxins	<u>2</u>
1.3	Human Health Based Reference Values for Dioxins in Soil	<u>5</u>
2.0	METHODS	<u>6</u>
2.1	Sampling Locations	<u>6</u>
2.2	Sample Collection and Storage	<u>6</u>
2.3	Sample Preparation	<u>8</u>
2.4	Sample Analysis	<u>9</u>
2.5	Quality Assurance	<u>9</u>
2.6	Data Validation/Verification	<u>11</u>
3.0	RESULTS	<u>13</u>
3.1	Data Validation Results	<u>13</u>
3.2	TEQ Values in Field Samples	<u>13</u>
3.3	Comparison to Risk-Based Guidelines	<u>16</u>
3.4	Contribution of PCBs	<u>16</u>
3.5	Contribution of Congeners Below the Quantitation Limit	<u>16</u>
3.6	Comparison of Bulk to Fine Samples	<u>17</u>
3.7	Quality Control Samples	<u>17</u>
4.0	DISCUSSION	<u>19</u>
4.1	Comparison to Denver Front Range Area Background Levels	<u>19</u>
4.2	Congener Composition	<u>20</u>
4.3	Dependence of TEQ on Soil Characteristics	<u>23</u>
5.0	SUMMARY AND CONCLUSIONS	<u>26</u>
6.0	REFERENCES	<u>27</u>

APPENDICES

APPENDIX A	RAW ANALYTICAL DATA AND CALCULATION OF TEQ VALUES
A1	Results for Field Samples
A2	Results for QC Samples
APPENDIX B	GRAPHICAL PRESENTATIONS
B1	Congener Concentrations and Contributions to TEQ
B2	Homologue Concentrations and Contributions to TEQ
B3	PCDD and PCDF Concentrations and Contribution to TEQ
B4	QC Sample Congener Concentrations and Contributions to TEQ
APPENDIX C	DETAILED SAMPLE LOCATION INFORMATION
APPENDIX D	MAPS OF TEQ RESULTS

LIST OF TABLES

Table 1. List of Analytes and TEFs	<u>3</u>
Table 2. Nominal TEQ(D/F) Concentrations in PE Samples	<u>10</u>
Table 3. Definition, Application, and Uses of Data Flags	<u>12</u>
Table 4. TEQ Values for RMA Random Grab Soil Samples	<u>14</u>
Table 5. Evaluation of Precision in Sample Pairs	<u>18</u>
Table 6. Evaluation of Accuracy Using Certified PE Samples	<u>18</u>
Table 7. Relative Contribution of Congeners to Total TEQ	<u>22</u>

LIST OF FIGURES

Figure 1. Random Sampling Locations at the Rocky Mountain Arsenal	<u>7</u>
Figure 2. Full TEQ(D/F) for Random Grab Samples at RMA	<u>15</u>
Figure 3. Comparison of RMA Random Samples to Denver Front Range Soils	<u>21</u>
Figure 4. Average Congener Concentration Profile in Random RMA Soils	<u>24</u>
Figure 5. Dependence of TEQ on Soil Characteristics	<u>25</u>

LIST OF ACRONYMS AND ABBREVIATIONS

Ah	aryl hydrocarbon
ATSDR	Agency for Toxic and Disease Registry
CAS	Columbia Analytical Services
COC	Contaminant of Concern
D/F	dioxin/furan
EMPC	Estimated Maximum Potential Concentration
HRGC/MS	High Resolution Gas Chromatography/Mass Spectrometry
LCS	Laboratory Control Sample
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MRI	Midwest Research Institute
NPL	National Priority List
OCP	organochlorine pesticide
PARCC	Precision, Accuracy, Representativeness, Comparability, and Completeness
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzodioxin
PCDF	polychlorinated dibenzofuran
PE	Performance Evaluation
ppt	parts per trillion (1 microgram per kilogram)
QA/QC	Quality Assurance/Quality Control
QATS	Quality Assurance Technical Support
RMA	Rocky Mountain Arsenal
SOP	Standard Operating Procedure
TCDD	2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin
TEF	Toxicity Equivalency Factor
TEQ	2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin (TCDD) equivalents
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
WHO	World Health Organization

LIST OF CHEMICAL ABBREVIATIONS

HpCB	heptachlorobiphenyl
HpCDD	heptachlorodibenzodioxin
HpCDF	heptachlorodibenzofuran
HxCB	hexachlorobiphenyl
HxCDD	hexachlorodibenzodioxin
HxCDF	hexachlorodibenzofuran
OCDD	octachlorodibenzodioxin
OCDF	octachlorodibenzofuran
PeCB	pentachlorobiphenyl
PeCDD	pentachlorodibenzodioxin
PeCDF	pentachlorodibenzofuran
TCB	tetrachlorobiphenyl
TCDD	2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin
TCDF	tetrachlorodibenzofuran

1.0 INTRODUCTION

1.1 Site Description

The Rocky Mountain Arsenal (RMA) is a parcel of approximately 27 square miles of land located north-east of Denver, Colorado. The RMA was previously used by the US Army for manufacturing and testing of munitions, and was subsequently used by Shell Oil Company for the manufacture of pesticides. Because of extensive chemical contamination in the central portion of the site, the United States Environmental Protection Agency (USEPA) became involved in studies to clean up RMA in 1982, and the site was placed on National Priorities List (NPL) in 1987. The chemicals of principal health concern at RMA vary from location to location, and include pesticides, metals, solvents, chemical process intermediates, and chemical warfare agents. In particular, several organochlorine pesticides (OCPs), mainly aldrin and dieldrin, are major contaminants of concern (COCs), as well as a number of their intermediates and degradation products (USEPA 1999).

Some members of the public stated they were concerned that RMA might be contaminated with dioxins. A review of this question was performed by Gannett Fleming (1999), and USEPA Region 8 concluded that data available at the time were insufficient to determine whether dioxins should or should not be considered chemicals of potential concern at RMA. In order to investigate this question, USEPA Region 8, working in cooperation with the State of Colorado and the Rocky Mountain Arsenal Remedial Venture Office, has undertaken a series of studies to characterize the levels of dioxins in on-site and off-site soils. This purpose of this study is to summarize data on the levels of dioxin in random soil samples collected from across RMA, and to compare the site data with the regional ambient data in order to judge whether levels at RMA are elevated compared to other comparable locations in and about the greater Denver area, and, if so, whether the levels are in a range of potential human health concern to on-site workers.

Other reports which are part of this project and which provide additional information on the absolute and relative level of dioxins in on-site and off-site soils include:

Denver Front Range Study. Dioxins in Surface Soil. Study 3: Western Tier Parcel,
Rocky Mountain Arsenal (USEPA 2001a)

Denver Front Range Study. Dioxins in Surface Soil. Study 4: Characterization of Dioxins, Furans and PCBs In Soil Samples Collected from Historic Use Areas the Rocky Mountain Arsenal (USEPA 2001b)

Denver Front Range Study. Dioxins in Surface Soil. Study 1: Characterization of Dioxins, Furans and PCBs In Soil Samples Collected from the Denver Front Range Area (USEPA 2001c)

1.2 Definition of Dioxins

"Dioxin" is usually used as a synonym for 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). The toxicity of TCDD is believed to be initiated by binding of the TCDD molecule to a cellular protein referred to as the aryl-hydrocarbon (Ah) receptor. However, there are many different chemicals besides TCDD that can bind to this receptor and trigger some or all of the toxic responses that are associated with TCDD exposure. This includes some other members (congeners) of the polychlorinated dibenzodioxin (PCDD) class, as well as some polychlorinated dibenzofurans (PCDFs), polychlorinated biphenyls (PCBs), other types of halogenated (e.g., brominated) dioxins and furans, as well as various other chlorinated hydrocarbons (e.g. chlorinated naphthalenes). For the purposes of this report, the term "dioxins" is meant to refer to the set of 29 congeners in the polychlorinated dioxin/furan/biphenyl group that bind to the aryl hydrocarbon (Ah) receptor and possess toxic characteristics similar to those of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). These 29 congeners are listed in Table 1.

In this study and report, greatest emphasis is placed on the 17 PCDD and PCDF congeners with TCDD-like activity, since PCBs are not considered to be chemicals of concern at RMA, and because the current USEPA soil screening levels for dioxins (USEPA 1998) are based only upon these congeners. However, the 12 PCB congeners with TCDD-like activity were included in the study and analyses for reasons of a) completeness for background characterization, and b) to help resolve mass-balance comparisons with TCDD bioassays that were conducted for RMA tissue samples and which could be performed (if needed) on soil samples.

Table 1. List of Analytes and TEFs

Class	Target Analyte	TEF		
		Mammals	Birds	Fish
Dibeno-p-dioxins (PCDDs)	2,3,7,8-TCDD	1	1	1
	1,2,3,7,8-PeCDD	1	1	1
	1,2,3,4,7,8-HxCDD	0.1	0.05	0.5
	1,2,3,6,7,8-HxCDD	0.1	0.01	0.01
	1,2,3,7,8,9-HxCDD	0.1	0.1	0.01
	1,2,3,4,6,7,8-HpCDD	0.01	< 0.001	0.001
	OCDD	0.0001	0.0001	<0.0001
Dibenzofurans (PCDFs)	2,3,7,8-TCDF	0.1	1	0.05
	1,2,3,7,8-PeCDF	0.05	0.1	0.05
	2,3,4,7,8-PeCDF	0.5	1	0.5
	1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
	1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
	1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
	2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
	1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
	1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
	OCDF	0.0001	0.0001	<0.0001
PCBs	3,3',4,4'-TCB (77)	0.0001	0.1	0.0005
	3,4,4',5-TCB (81)	0.0001	0.05	0.0001
	3,3',4,4'-5-PeCB (126)	0.1	0.1	0.005
	3,3',4,4',5,5'-HxCB (169)	0.01	0.001	0.00005
	2,3,3',4,4'-PeCB (105)	0.0001	0.0001	< 0.000005
	2,3,4,4',5-PeCB (114)	0.0005	0.0001	< 0.000005
	2,3',4,4',5-PeCB (118)	0.0001	0.00001	< 0.000005
	2',3,4,4',5-PeCB (123)	0.0001	0.00001	< 0.000005
	2,3,3',4,4',5-HxCB (156)	0.0005	0.0001	< 0.000005
	2,3,3',4,4',5'-HxCB (157)	0.0005	0.0001	< 0.000005
	2,3',4,4',5,5'-HxCB (167)	0.00001	0.00001	< 0.000005
	2,3,3',4,4',5,5'-HpCB (189)	0.0001	0.00001	< 0.000005

TEF = Toxicity Equivalency Factor

TEF values are consensus estimates recommended by WHO (Van den Berg et al. 1998)

Relative Toxicity of Dioxin Congeners

Dioxins are of potential health concern because they may pose an increased risk of cancer and other non-cancer adverse health effects at extremely low levels of exposure. However, not all dioxin congeners are equally toxic. The relative toxicologic potency of a congener, compared to that of the most toxic form (2,3,7,8-TCDD), is expressed in terms of the Toxicity Equivalency Factor (TEF). Table 1 lists the current consensus TEF values for mammals (including humans), birds, and fish. These TEF values were developed by a panel of experts assembled by the World Health Organization (WHO) (Van den Berg et al. 1998), and have been adopted for use by the USEPA (USEPA 2000). It should be noted that TEFs are often based on limited data, and so they are recommended for use as only approximations of the relative toxicity of each congener, rounded to the nearest half order of magnitude.

Calculation of TCDD-Equivalents (TEQ) in Soil

The aggregate toxicity of a mixture of different dioxins in an exposure medium (soil, food web items, water, etc.) is a complex function of the following variables:

- a) the concentration of each congener in the medium
- b) the chronic average daily intake of the medium
- c) the absorption of each congener from that medium
- d) the toxicokinetics (distribution, metabolism, and elimination) of the congeners
- e) the relative biological potency of the congeners

Thus, calculation of health risk from exposure to soil that contains a mixture of congeners must take all of these variables into account. However, for purposes of screening-level evaluations of dioxin concentrations in soil samples, it is usually most convenient to calculate the concentration of TCDD-Equivalents (TEQ) present in the soil as the TEF-weighted sum of each of the 29 dioxin-like congeners (17 dioxins and furans, plus 12 PCBs), as follows:

$$\text{TEQ (total)} = \sum_{i=1}^{29} (C_i \cdot \text{TEF}_i)$$

In cases where interest is focused on the contribution of PCDDs and PCDFs only (i.e., PCBs not included), the value is calculated as:

$$\text{TEQ (D / F)} = \sum_{i=1}^{17} (C_i \cdot \text{TEF}_i)$$

It is important to understand that this application of TEFs to the calculation of soil TEQ values is appropriate only for screening level purposes. This is because TEFs are derived from, and thus should only be applied to, biological endpoints (e.g., embryotoxicity). The soil TEQ approach does not account for the potential influences of differential absorption, metabolism, distribution, and excretion of different congeners from soil, and risk assessors should account for these uncertainties in the interpretation of the soil TEQ values.

1.3 Human Health Based Reference Values for Dioxins in Soil

The USEPA has currently established a default concentration value of 1,000 parts per trillion (ppt) TEQ in surface soil as a concentration that is not of cancer or non-cancer concern for lifetime exposure of residents (USEPA 1998a), even when no other site-specific data are known. For commercial and industrial land uses, USEPA guidelines identify 5,000 to 20,000 ppt TEQ as the concentration of concern in soil. These soil screening concentrations are based only upon the 17 TCDD-like PCDDs and PCDFs, calculated using the TEFs for mammals recently recommended by the WHO (Van den Berg et al. 1998).

The Agency for Toxic Substances and Disease Registry (ATSDR) has also established an interim policy guideline for human (residential) exposure to dioxin and dioxin-like compounds in soil (De Rosa et al. 1997). ATSDR identifies a concentration of 50 ppt TEQ in soil as a "screening level," below which no further investigation or characterization will usually be required. ATSDR identifies a concentration of 1,000 ppt TEQ as an "action level," indicating that public health actions such as surveillance, research, health studies, community education, or exposure investigations should be considered. Concentrations between 50 ppt and 1000 ppt TEQ are identified as "evaluation levels," indicating that further investigation of site-specific factors regarding the extent and possible public health implications of the exposure may be warranted.

The USEPA is in the process of completing a comprehensive reassessment of dioxin toxicity, and has tentatively concluded that the carcinogenic and non-carcinogenic potency of dioxins may be somewhat greater than previously believed (USEPA 2000). However, until a complete peer review and cross-program policy assessment of the impacts of this report can be

performed, USEPA recommends that the 1,000 ppt TEQ concentration in surface soil continue to be used as a soil screening level for residential land uses (USEPA 1998a), and that 5,000 ppt TEQ be used as a frame of reference for assessing exposure of commercial workers.

2.0 METHODS

A detailed description of the rationale, methods, and Standard Operating Procedures (SOPs) used in this study is provided in the Project Plan for the study (USEPA 1999). A summary of key elements of the study design and of the methods employed is presented below.

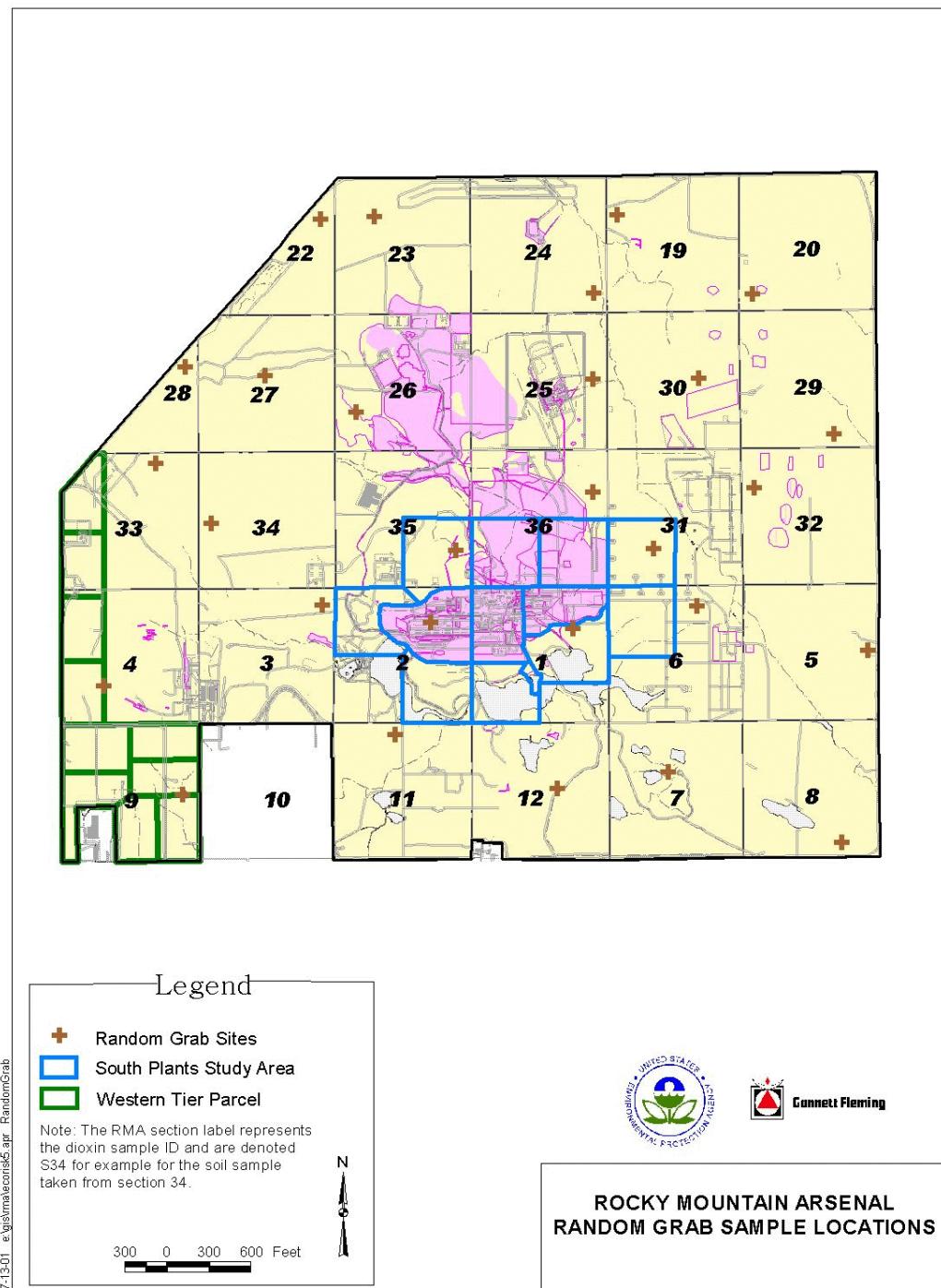
2.1 Sampling Locations

As noted above, RMA is an area of approximately 27 square miles. As shown in Figure 1, this area is divided into 28 Sections. One grab sample was collected from each section at a randomly selected location. These sampling locations are indicated by red "x's" in Figure 1. Detailed information on each of the sampling locations is provided in Appendix C.

2.2 Sample Collection and Storage

Because dioxins nearly always bind tightly to soil, it is expected that any dioxin contamination in soil attributable to atmospheric fallout, application of pesticides, or surface disposal of dioxin-contaminated material will be restricted mainly to the surface. Thus, surface soil is the exposure medium of chief concern for both human and ecological receptors. Therefore, all soil samples collected for this study were grab samples collected at 0-2 inches in depth.

Samples were collected using clean techniques that included use of disposable stainless steel trowels (one per sampling location) and plastic gloves. A ruler was used to ensure that the actual depth to which soil was collected was within $\frac{1}{2}$ inch of the target (i.e., a bottom depth of no less than 1.5 inches and no greater than 2.5 inches). Loose debris and most gravel or pebbles were removed from the soil sampling site. The surface soil was placed directly into a clean 16-ounce amber glass jar, filled to capacity (about 500 grams of soil), sealed with a teflon-lined lid, and stored in these bottles at room temperature in the dark until shipped in sealed plastic coolers

Figure 1. Random Sampling Locations at the Rocky Mountain Arsenal

with frozen ice-packs and water temperature tubes that helped ensure no excess heating occurred during transportation to the processing laboratory.

2.3 Sample Preparation

All soil samples collected in the field were submitted under chain-of-custody to Columbia Analytical Services (CAS) for sample preparation. Each sample was air-dried and weighed, followed by coarse-sieving through a #10 (2 millimeter) stainless steel screen. The fraction passing the coarse screen is referred to as the "bulk" fraction. A portion of the bulk composite sample was placed in a clean amber glass jar and stored for possible future use, while the remainder of the bulk sample was further sieved through a 60-mesh (250 micrometer) stainless steel screen in order to isolate soil particles less than 250 micrometer in diameter. This is referred to as the "fine" fraction. Each fine-sieved soil sample was thoroughly mixed and placed into four new amber sample bottles, with each bottle containing about 26 grams of the fine-sieved soil. These four aliquots of fine-sieved soil were intended to be as identical as possible, for use in reanalysis (if needed) and for establishing intra-laboratory and inter-laboratory reproducibility (precision) for quality control purposes. All processed soil samples were sent under chain of custody to the USEPA Regional Laboratory in Golden, CO, for storage and for organization of samples for later shipments to the analytical laboratory in Kansas City, MO.

The "fine" fraction was isolated for chemical analysis because it is believed that fine soil particles can electrostatically adhere to skin and thus are more likely be ingested by hand to mouth contact than coarse particles. Hence it is concluded that the fine soil fraction is the most relevant media for use in evaluating human health risk. The bulk soil samples were retained for purposes of evaluating the potential enrichment of TEQ concentrations in the fine-sieved fraction due to small soil particles having greater surface to mass ratios than their bulk soil counterparts. It should be noted that most historic soil sampling studies for dioxins have only evaluated bulk soils, and so consideration needs to be given when comparing historic bulk dioxin results and the results for dioxin TEQs in this study's fine soil samples. If enrichment is present, it would cause the fine soil fractions to have greater concentrations of TEQs than their corresponding bulk counterparts, and bulk soil results would tend to underestimate exposure.

2.4 Sample Analysis

Following sample preparation as described above, samples were submitted by USEPA Region 8 under chain of custody to Midwest Research Institute (MRI) for congener-specific analysis of PCDDs, PCDFs, and PCBs. This type of analysis requires sophisticated extraction and clean-up procedures to accurately measure all of the various forms of PCDDs, PCDFs, and PCBs, as detailed in Standard Operating Procedure 11 of the Project Plan USEPA (1999). In brief, the congeners are determined using an isotope dilution method via high resolution gas chromatography/mass spectrometry (HRGC/HRMS). Samples are fortified with known quantities of ¹³C-labeled PCDD/PCDF/PCB isomers and extracted with organic solvents, using two columns so that all 12 PCBs can be retained for analysis. Before cleanup of the extracts, the analytes are exchanged into hexane and fortified with ³⁷Cl-labeled 2,3,7,8-tetrachlorodibenzo-*p*-dioxin. Finally, the extracts are sequentially partitioned against concentrated acid and base solutions.

The Method Detection Limit (MDL) for this study-specific analytical method was defined as an analyte signal that was 2.5 times the average background signal ("noise"). An estimate of the average signal noise is available for each analyte in each sample, so the MDL varies from sample to sample and from analyte to analyte. The Method Quantitation Limit (MQL) is based partly on the lowest calibration standard used, and was defined as a signal that was 10-times the average signal noise. Because the noise level varied from sample to sample and analyte to analyte, MDLs and MQLs also varied from sample to sample and from congener to congener. Most PCDD/PCDF congeners had MQL values between 0.03 and 1.3 parts per trillion (ppt), and most PCB congeners had MQLs between 0.2 and 5.4 ppt.

2.5 Quality Assurance

A number of steps were taken to obtain data that would allow an assessment of the quality and reliability of the data collected, so that assessments of the scientific usability of the data could be made and defended. The analytical laboratory routinely processed and analyzed "lots" (batches) of 20 samples at a time. Of these 20 samples, two were used for laboratory control samples (LCS) and blanks. Therefore, 18 samples were usually available for USEPA to submit to MRI as a batch. In general, these 18 samples were comprised of 14 field samples plus four Quality Control (QC) samples, as described below.

Performance Evaluation Samples

Performance Evaluation (PE) samples are samples of soil that contain known quantities of analyte and that are submitted blind to the analytical laboratory. In this study, three different PE samples were used. These were obtained from USEPA's Quality Assurance Technical Support (QATS) laboratory. Nominal values (ppt as TEQ in bulk soil, based on the 17 PCDD/PCDF congeners only) are listed below:

Table 2. Nominal TEQ(D/F) Concentrations in PE Samples

PE Sample (Bulk Soil)	Nominal TEQ(D/F) (ppt)
Native western soil (estimated value)	< 2
Low standard (certified value)	35
Medium standard (certified value)	59

One aliquot of each these three PE samples from QATS was submitted to the laboratory along with each batch of field samples.

Field Splits and Duplicates

A field duplicate is a second sample of soil collected simultaneously with the first sample. In this case, field duplicates were collected by alternating scoops of soil into two bottles with separate and random sample identification numbers. A field split is a sample that is generated by dividing a single field sample into two parts. As described above, in this study every field sample was dried and sieved by CAS, and this fine material was divided into four essentially identical aliquots of 26 grams each. EPA Region 8 selected random samples to submit as split samples, and a second bottle of these samples was assigned a new random sample identification number and submitted in random order for analysis by MRI. Analysis of these types of samples provided data on the variability within and between related samples. One sample of this type (either field split or field duplicate) was submitted to the laboratory (blind) with each set of 14 field samples.

Laboratory Quality Control Samples

Internal laboratory quality control samples are samples prepared and run by the laboratory in a non-blind fashion to monitor the performance of the analytical method. Laboratory QC samples included Method Blanks (analyte-free soil), Laboratory Control Samples (similar to PE samples, but the identity and true concentration are known to the laboratory), and optionally Method Duplicates (investigative samples that are split prior to sample preparation at the analytical laboratory). As noted above, two samples in each batch were used by the laboratory for laboratory QC samples.

2.6 Data Validation/Verification

Validation of analytical results was conducted according to SOP 803 (revision 1) of the Project Plan (USEPA 1999). This validation method was tailored to match the site-specific method used to analyze the 29 dioxin-like congeners in soils. An independent contract chemist team, with expertise in validation of PCDD, PCDF, and PCB analytical results, conducted the analytical reviews. Full validation was performed for all samples.

Major analytical factors and QA/QC performance were reviewed against defined Precision, Accuracy, Representativeness, Comparability, and Completeness (PARCC) criteria to ensure that results were reliable and usable for the objective identified in the Project Plan . Narratives were produced for each analytical lot to describe the results of the data validation for that lot. Each data value (i.e., each concentration value) was assigned a data usability flag, if needed, using the data quality flag codes presented in Table 3. In accordance with USEPA data usability guidelines (USEPA 1992), these flags were used for producing two alternative data sets:

1) a semi-quantitative set of results in which congeners that yielded signals below the sample-specific detection limit for that congener (signal/noise ratio less than 2.5) were evaluated by assuming a concentration value equal to $\frac{1}{2}$ the detection limit for that congener, and other flagged data were adjusted according to the rules shown in Table 3. This is referred to in this report as the “**Full**” data set.

2) a quantitative set of results based only on those congeners that have no disqualifying flags (D, NJ, R and LT), or have adjusted quantitative values as described in Table 3. This is referred to in this report as the “**Quant**” data set.

Table 3. Definition, Application, and Uses of Data Flags

Validation Flags	Meaning of Flags for Dioxin Analyses in Soils and Tissues by the MRI Lab	Data Usability (a)	
		Full data set used (semi- quantitative)	Quantitative (qualified sub-set used)
E	<u>Estimated Maximum Potential Concentration</u> ; the relative ion abundance ratios did not meet the acceptance limits.	use value	use $\frac{1}{2}$ value
D	EMPC is caused by <u>polychlorinated Diphenyl ether</u> interference.	use $\frac{1}{2}$ value	don't use
B	Analyte was detected in associated <u>Method Blank</u> , sample concentration <5x MB concentration.	use value	use $\frac{1}{2}$ value
C	Concentration is <u>above upper Calibration Standard</u> ; result is an estimate, flagged C by lab and J added by validator.	use value	use value
I	<u>Recovery of 13C-labeled Isotopic analyte</u> outside of criteria	use value	use value
J	<u>Estimated</u> : e.g., isotopic standard is outside CCAL range, native analyte recovery in LCS is outside criteria, etc.	use value	use $\frac{1}{2}$ value
NJ	<u>Presumptive evidence</u> for the presence of an analyte with an estimated value; if used for 2378-TCDF, see "U" below.	use $\frac{1}{2}$ value	don't use
S	Peak is <u>Saturated</u> ; result, if calculated, is flagged by the validator as an estimate - "J".	use value	use value
U	<u>Unconfirmed</u> : column is not specific for 2,3,7,8-TCDF; confirmation not requested. Validator now uses "NJ" flag.	use value	use $\frac{1}{2}$ value
R	<u>Rejected</u> : result is invalid and <u>not usable</u> .	use $\frac{1}{2}$ MDL	don't use
<i>use of MRI Laboratory's reported "LT" (less than) values <MQL (10 x Signal:Noise)</i>			
LT applied first to data, then apply flags!	"LT" is not a true "flag", but if a LT result is a " detect " above the MDL ($2.5 \times$ Signal:Noise = lab EDL), then	use value	use $\frac{1}{2}$ value
	"LT" is not a true "flag", but if a LT result is a " non-detect " below the MDL ($2.5 \times$ Signal:Noise = lab EDL), then	use $\frac{1}{2}$ EDL	don't use

(a) In accord with concepts in the 1992 EPA Data Usability for Risk Assessment in Superfund guidance (USEPA 1992), data quality flags are used to produce two data-sets: 1) a "Full" set of semi-quantitative results with an **actual** or a **proxy** value for each of the measured congeners; and 2) a more "Quantitative" but limited set of results that has more certain identification and more accurate quantities of congeners which have **no disqualifying flags** (D, NJ, R or LT), but can use **limited proxies** (E, B, J or U). This distinction is made to better understand and limit artifactual impacts of the *less certain estimated values* on TEQs, analyzing the degree of this sensitivity to trace-level "noise" by comparing TEQs from these two data sets. In addition, congener profile pattern analysis should only use the analytes that are quantifiable (above the MQL).

These two datasets were prepared to help evaluate the magnitude of effects of estimated values from the Full dataset on TEQs, and to show how the quantitative subset of results can be properly derived to statistically evaluate the profiles of congeners in soils. In general, the Full TEQ(D/F) results are considered to be the most relevant in evaluating potential health risks from dioxins.

3.0 RESULTS

Detailed analytical results for each field sample are presented in Appendix A1, and detailed results for each QA sample run as part of this study are presented in Appendix A2. Graphical representations are presented in Appendix B. The results are summarized below.

3.1 Data Validation Results

Full validation of the data found the analytical results to be usable, as qualified with the appropriate data quality flags (see Appendix A).

3.2 TEQ Values in Field Samples

Table 4 presents the results (expressed as ppt of TEQ) for each of the 28 grab samples collected during the study. The spatial pattern for Full TEQ(D/F) is presented in the map in Figure 2.

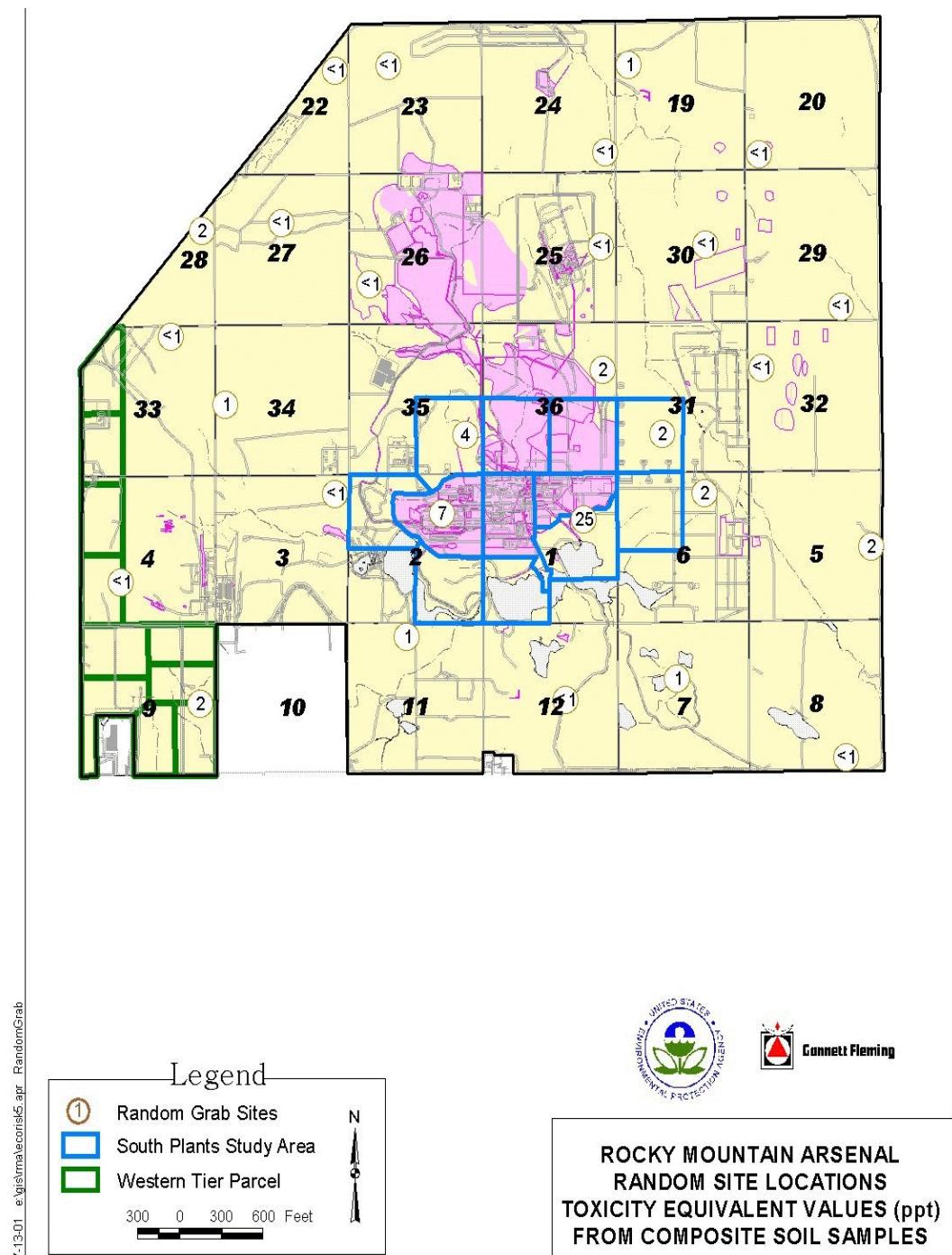
As seen, most samples (25 out of 28) had full TEQ values that were less than 3 ppt. Full TEQ(D/F) values were slightly elevated (compared to the rest of the samples) in Section 1 (25 ppt), Section 2 (7 ppt), and Section 35 (4 ppt), all of which are located in the South Plants area of RMA. As discussed in USEPA (2001b), other samples collected in this area support the conclusion that dioxin levels are slightly elevated compared to the rest of RMA in the South Plants area, but that contaminant levels tend to fall off rapidly as a function of distance from this historic source area.

Comparison of the values for Full and Quant TEQ in Table 4 reveal that in most cases the two values are similar, especially for the samples with elevated levels, with an average difference of about 0.2-0.3 ppt. This indicates that congeners at or below the quantitation limit do not contribute strongly to the Full TEQ value.

Table 4. TEQ Values for RMA Random Grab Soil Samples

Section	Dioxin/Furan Only		PCBs Only		Total	
	Full	Quant	Full	Quant	Full	Quant
S1	25.3	24.6	0.8	0.5	26.1	25.1
S2	7.2	7.0	1.2	1.1	8.3	8.1
S3	0.7	0.6	0.3	0.2	1.0	0.8
S4	0.6	0.4	0.5	0.3	1.1	0.7
S5	1.8	1.5	0.2	0.2	2.0	1.7
S6	1.6	1.3	0.2	0.2	1.9	1.5
S7	1.0	0.9	0.4	0.4	1.4	1.3
S8	0.3	0.2	0.1	0.1	0.4	0.2
S9	1.6	1.4	1.2	0.7	2.8	2.0
S11	1.0	0.8	0.6	0.6	1.6	1.4
S12	0.7	0.4	0.3	0.3	1.1	0.7
S19	1.3	1.2	0.8	0.8	2.0	2.0
S20	0.7	0.4	0.2	0.2	0.9	0.6
S22	0.7	0.5	0.3	0.3	1.1	0.8
S23	0.3	0.2	0.1	0.1	0.5	0.3
S24	0.3	0.2	0.2	0.2	0.5	0.3
S25	0.1	0.0	0.0	0.0	0.2	0.0
S26	0.8	0.7	0.3	0.1	1.1	0.8
S27	0.2	0.2	0.2	0.1	0.4	0.3
S28	1.5	1.3	1.2	0.7	2.7	1.9
S29	0.3	0.2	0.1	0.1	0.4	0.3
S30	0.5	0.2	0.1	0.1	0.7	0.4
S31	2.0	1.7	0.4	0.4	2.3	2.0
S32	0.8	0.5	0.2	0.2	1.0	0.8
S33	0.8	0.6	0.8	0.4	1.6	1.0
S34	0.9	0.9	0.7	0.7	1.7	1.6
S35	3.5	3.2	1.5	0.8	5.1	4.0
S36	1.5	1.3	0.5	0.4	2.0	1.7

All TEQ values are expressed in units of ppt

Figure 2. Full TEQ(D/F) for Random Grab Samples at RMA

3.3 Comparison to Risk-Based Guidelines

In accordance with the Project Plan developed before implementation of this study, the potential health risk to on-site workers from future exposures to dioxins in RMA soils was evaluated by comparing the TEQ concentration value in each grab sample with the USEPA default health-based reference range of 5,000-20,000 ppt identified by USEPA as the potential level of concern for workers (EBASCO 1994). Inspection of Figure 2 and Table 4 reveals that all of the samples collected in this study, including the samples from near the South Plants area of the site (the region with the greatest impact from historic releases), the Full TEQ for PCDDs and PCDFs are all far below the level of potential health concern to workers:

USEPA Health Criterion for Workers:	5000 ppt
Maximum RMA Random Grab sample:	25 ppt
Mean RMA Random Grab sample:	2.1 ppt

It should also be noted that the areas of RMA with the highest dioxin levels (including South Plants) are currently scheduled for soil remediation due to the presence of organochlorine pesticide contamination. Once this remediation is complete, it is expected that dioxin levels across RMA will be approximately the same as for any other open space area in the Denver Front Range area.

3.4 Contribution of PCBs

As shown in Table 4 (center section), the concentration of PCBs (expressed as TEQ) in the random RMA soil samples is usually less than 1 ppt, with an average across all samples of 0.5 ppt. In these samples, PCBs contribute from 3% to 51% of the total, with an average across all 28 samples of about 30%.

3.5 Contribution of Congeners Below the Quantitation Limit

As noted above, in the calculation of the Full TEQ value for a sample, all congeners that were below the detection limit (signal/noise ratio < 2.5) were evaluated by assuming a concentration value equal to $\frac{1}{2}$ the detection limit. This is the approach is that is normally used to evaluate chemicals of concern at Superfund sites (USEPA 1989). In order to evaluate the relative contribution of congeners that were either not detected, or else were present at such low

concentrations that their true concentration could only be estimated, a second calculation of "Quant" TEQ was performed, which included only those congeners that were detected above the quantitation limit (signal/noise > 10). Other occasional adjustments to reported concentrations of congeners were made when certain qualifier flags were assigned to the result, based on the criteria shown in Table 3.

For the 28 random grab samples from RMA, the average ratio of Full TEQ(D/F) to Quant TEQ(D/F) was 1.26. For TEQ(Total), the ratio of Full TEQ to Quant TEQ was 1.25. This indicates that congeners below the quantitation limit contribute an average of about 25-26% to the TEQ values at random soil sampling locations at RMA.

3.6 Comparison of Bulk to Fine Samples

As noted earlier, all soil samples were prepared by sieving to isolate the "fine" fraction of particles less than 250 micrometers in diameter, since it is believed that this size fraction is likely to be of greater relevance to human exposure than the bulk fraction. However, since most other studies of dioxin concentrations in soil have used un-sieved soil, throughout the project some bulk soil samples were also analyzed to allow a comparison of concentration values in the bulk and fine fractions. In this particular study, only one such bulk sample (from Section 2) was analyzed. In this sample, the ratio of Full TEQ(D/F) in the fine fraction divided by that in the bulk sample was 1.24, and the ratio for Full TEQ(Total) was 1.22. Because this ratio is based on only one sample, no firm conclusions can be drawn. However, if a similar enrichment in the fine fraction were to be general, then evaluations of dioxin TEQs that are based only on analyses of bulk samples may tend to underestimate human health risk.

3.7 Quality Control Samples

Quality control samples that were analyzed as part of this study indicate that the data are reliable and accurate, as described below.

Method Blanks

Four method blanks were included with the samples for this study. The values for Full TEQ (total) ranged from 0.1 to 0.6 ppt (mean = 0.3 ppt). This indicates that there is no significant source of PCDD, PCDF or PCB contamination within the analytical laboratory.

Splits and Duplicates

TEQ(D/F) values for duplicate and split pairs are as follows:

Table 5. Evaluation of Precision in Sample Pairs

Sample	Full TEQ(D/F) (ppt)	Quant TEQ(D/F) (ppt)
S-1	25.3	24.6
S-1 Split	6.9	6.7
S-5	1.8	1.5
S-5 Split	1.1	0.2
S-23	0.3	0.2
S-23 Dup	0.4	0.3
S-35	3.5	3.2
S-35 Split	3.1	2.7

As seen, except for the first pair (S-1), there is good agreement between splits and duplicate pairs, with an average difference of less than 1 ppt, which is well within the acceptability criterion of 1 MQL (about 5 ppt TEQ) that was established by the Project Plan (USEPA 1999) for low-concentration samples. The basis for the discrepancy between the original and split result for sample S-1 is not known, but is considered to be atypical.

Performance Evaluation Samples

Analytical results for the soil standards (PE samples) obtained from the USEPA QATS laboratory are summarized below.

Table 6. Evaluation of Accuracy Using Certified PE Samples

PE Sample	Certified Conc. (ppt)	N	Measured TEQ(D/F) (ppt)	
			Full	Quant
Low Standard (bulk)	35	2	47.5 ± 3.2	47.3 ± 3.1
Medium Standard (bulk)	59	2	74.8 ± 1.9	73.5 ± 0.3

As seen, measured values for bulk PE samples are somewhat higher than but are still in reasonable accord with the expected (nominal) values.

Five samples of the "Clean Soil" PE sample provided by the QATS laboratory were also analyzed on an on-going basis throughout the study. This is the soil used by QATS contractors for spiking with TCDD-like congeners to produce the PE standard soils. This soil sample was estimated to contain less than 2 ppt TEQ in the bulk fraction, but this was not a certified value. The samples of Clean Soil analyzed in this study were sieved to isolate the fine fraction before analysis, so the expected value in the fine fraction is not known. However, analytical results were low (1.8 ± 0.8 ppt Full TEQ(D/F) and 1.6 ± 0.9 ppt Full TEQ(Total)), consistent with the estimated values in the bulk soil. Because these samples were submitted to CAS in parallel with field samples, these results establish that there is no significant source of contamination during the sample preparation or the sample analysis steps.

Laboratory Spikes

Four different laboratory spikes were analyzed in association with the field samples from this study. Spike concentrations were 20 ppt for TCDD and TCDF, 100 ppt for each of the penta-, hexa- and hepta-PCDDs and PCDFs, and 200 ppt for OCDD, OCDF, and each of the PCBs. Based on this spiking mixture, the nominal TEQ(D/F) is 250 ppt, and the nominal TEQ(Total) is 272.5 ppt. Average recovery of individual PCDD/PCDF congeners ranged from 73% to 112%, with an average across all samples of 93%. Average recovery of individual PCBs ranged from 105% to 128%, with an average across all samples of 111%. When expressed as Full TEQ, recovery was 91% to 102% (mean = 97%) for TEQ(D/F), and was 92% to 103% (mean = 98%) for TEQ(Total). This indicates that matrix interference is not likely to be of concern.

4.0 DISCUSSION

4.1 Comparison to Denver Front Range Area Background Levels

Dioxins can be formed and released to the environment from a variety of sources, especially incinerators that burn medical and municipal wastes (USEPA 1994). In addition, dioxins can be formed in low levels from the combustion of coal and wood, and dioxins are released from power plants, wood burning furnaces, forest fires, etc. (USEPA 1998). As a

consequence of these multiple and widespread sources, dioxins are believed to be present in low concentrations in nearly all samples of surface soil.

Limited data are available in the literature on the concentrations of PCDDs and PCDFs in “background” soil. A summary of these data are presented in USEPA (2001c). In general, mean values for rural and urban areas are mainly in the 1-6 ppt range, although some lower and some higher values are reported. However, there are a number of limitations to these data (USEPA 2001c), so in order to strengthen the database for site-specific decision making, the USEPA Region 8 has recently completed studies of dioxin levels in a range of typical soils from multiple locations and land uses across the Denver Front Range (USEPA 2001c). Appendix D contains maps that summarize the results of this study, and Figure 3 compares the distribution of Full TEQ(D/F) values observed at the random sampling locations within RMA with values observed at sampling locations around the greater Denver Front Range area (USEPA 2001c). As seen, the TEQ(D/F) values at RMA are similar to levels observed in open space and agricultural areas, and are lower than values observed in commercial, industrial and residential areas. Multiple pairwise comparisons using the Mann-Whitney rank sum test indicate that there is no statistical difference between the on-post random samples and the Denver Front Range data sets for open space ($p = 0.853$) or agricultural lands ($p = 0.900$), while the on-post random samples are different (lower) than the off-post commercial, industrial and residential data sets ($p < 0.01$). This indicates that, except for areas in the immediate vicinity of the former manufacturing area at RMA, there has been no detectable release of dioxins to RMA soils from a site-specific source.

4.2 Congener Composition

The congener composition of a soil sample may provide useful information about the source of the dioxin contamination, and helps to reveal which specific congeners are contributing the majority of the risk.

Appendix A shows the relative (percent) contribution of each of the 29 congeners to the total TEQ in each of the soil samples in this study. The mean contribution of each congener (percent contribution within a sample averaged across all samples) to TEQ is summarized in Table 7. As seen, most of the Full TEQ(Total) is contributed by PCB-126, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,6,7,8-HpCDD.

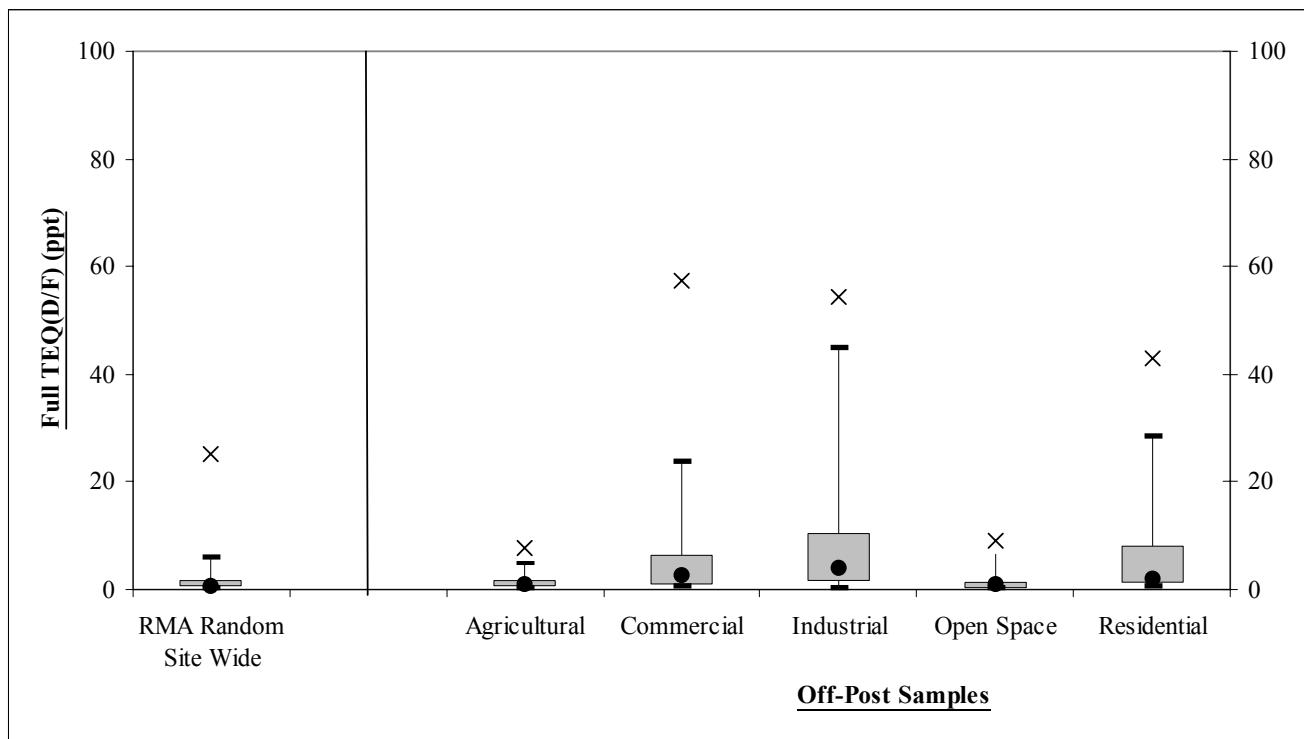
Figure 3. Comparison of RMA Random Samples to Denver Front Range Soils

Table 7. Relative Contribution of Congeners to Total TEQ

Analyte	Mean Percent Contribution to the Total TEQ	
	Full	Quant
2,3,7,8-TCDF	1.3%	0.0%
2,3,7,8-TCDD	3.0%	2.6%
1,2,3,7,8-PeCDF	2.6%	2.9%
2,3,4,7,8-PeCDF	9.5%	8.3%
1,2,3,7,8-PeCDD	9.4%	4.7%
1,2,3,4,7,8-HxCDF	8.4%	9.4%
1,2,3,6,7,8-HxCDF	5.3%	5.1%
2,3,4,6,7,8-HxCDF	3.2%	3.0%
1,2,3,7,8,9-HxCDF	5.0%	4.4%
1,2,3,4,7,8-HxCDD	1.9%	1.5%
1,2,3,6,7,8-HxCDD	3.7%	3.9%
1,2,3,7,8,9-HxCDD	4.3%	5.0%
1,2,3,4,6,7,8-HpCDF	3.7%	4.7%
1,2,3,4,7,8,9-HpCDF	1.2%	1.3%
1,2,3,4,6,7,8-HpCDD	7.2%	11.6%
OCDF	0.3%	0.3%
OCDD	0.6%	0.9%
PCB-77	0.1%	0.1%
PCB-81	0.0%	0.0%
PCB-105	0.6%	0.7%
PCB-114	0.1%	0.1%
PCB-118	1.2%	1.3%
PCB-123	0.0%	0.0%
PCB-126	25.8%	26.3%
PCB-156	1.0%	1.3%
PCB-157	0.3%	0.3%
PCB-167	0.0%	0.0%
PCB-169	0.3%	0.3%
PCB-189	0.0%	0.0%
D/F Only	70.5%	69.5%
PCBs Only	29.5%	30.5%
Total	100.0%	100.0%

Cells greater than 5% have been shaded to highlight the main contributors

Appendix B1 presents a series of graphs showing the absolute chemical concentrations and TEQ contributions of each of the 29 congeners in each of the field soil samples collected during this study. Appendix B2 shows the aggregate concentrations and TEQ contributions for each of the five homologue classes of the 17 TCDD-like dioxins and furans. Appendix B3 shows the relationships between aggregate concentrations and TEQ contributions of dioxins compared to furans. Appendix B4 presents similar concentration graphs for QA samples. In all cases, greater emphasis is placed on the quantitative concentration data than the full concentration data for evaluation of congener concentration profiles.

Figure 4 summarizes the average quantitative congener concentration pattern in random RMA soils. The upper panel shows congeners in the PCDD/PCDF class, while the lower panel shows congeners in the PCB class. As seen in the upper panel, the primary congener in the dioxin/furan class is usually OCDD, although a very high level of OCDF along with several other hepta- and hexa-PCDDs and PCDFs were detected in Section 1. As seen in the lower panel, several PCBs are usually present, primarily 105, 118, 156, and 167.

A more detailed and quantitative analysis of the congener concentration values in surface soil samples from the random areas of RMA along with results from other locations at RMA and from multiple locations and land uses around the Denver Front Range area will be presented in a subsequent report.

4.3 Dependence of TEQ on Soil Characteristics

Binding of dioxins to soil particles is a physical process that might be expected to depend on the total organic carbon (TOC) content of the soil, as well as the surface-area-to-mass ratio (i.e., the particle size distribution). Such a dependence of TEQ levels on soil characteristics has been noted by Rogowski et al. (1999), although these data are somewhat limited by use of TEQ values calculated from congener concentrations that were largely below the MDL.

Figure 5 (Panel A) summarizes the relationship between Full TEQ(D/F) and soil TOC. The data point for Section 1 was excluded from the analysis because the relatively elevated TEQ value in this Section is attributed to historic release from South Plant facilities. The data from Sections 2 and 35 were retained, since the impact of the South Plants area on these samples appears to be minimal. As seen, TOC levels ranged from about 0.5% to 2% in the soil samples, while Full TEQ(D/F) levels ranged from about 0.1 to 25.3 ppt. The slope of the best-fit linear

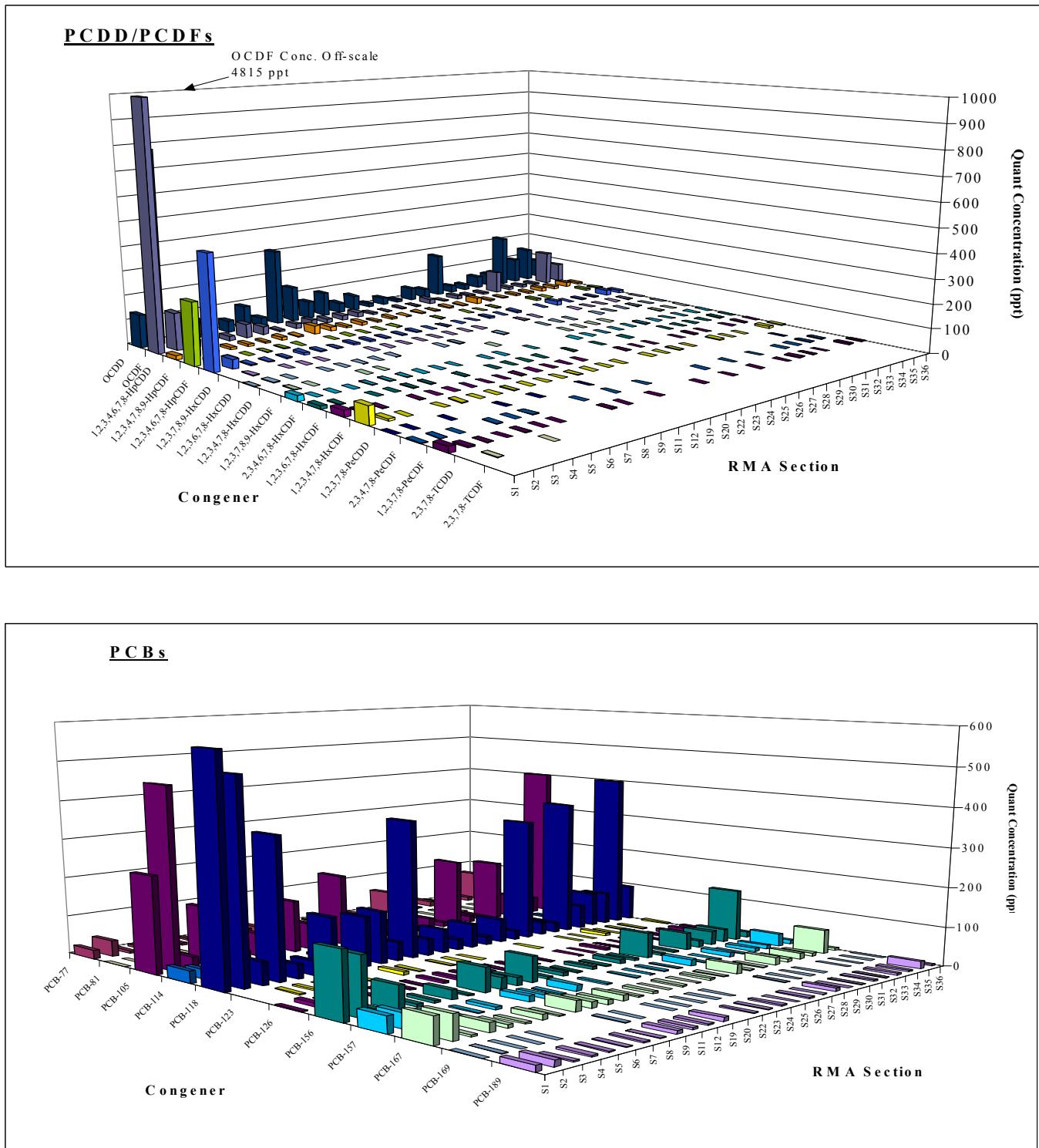
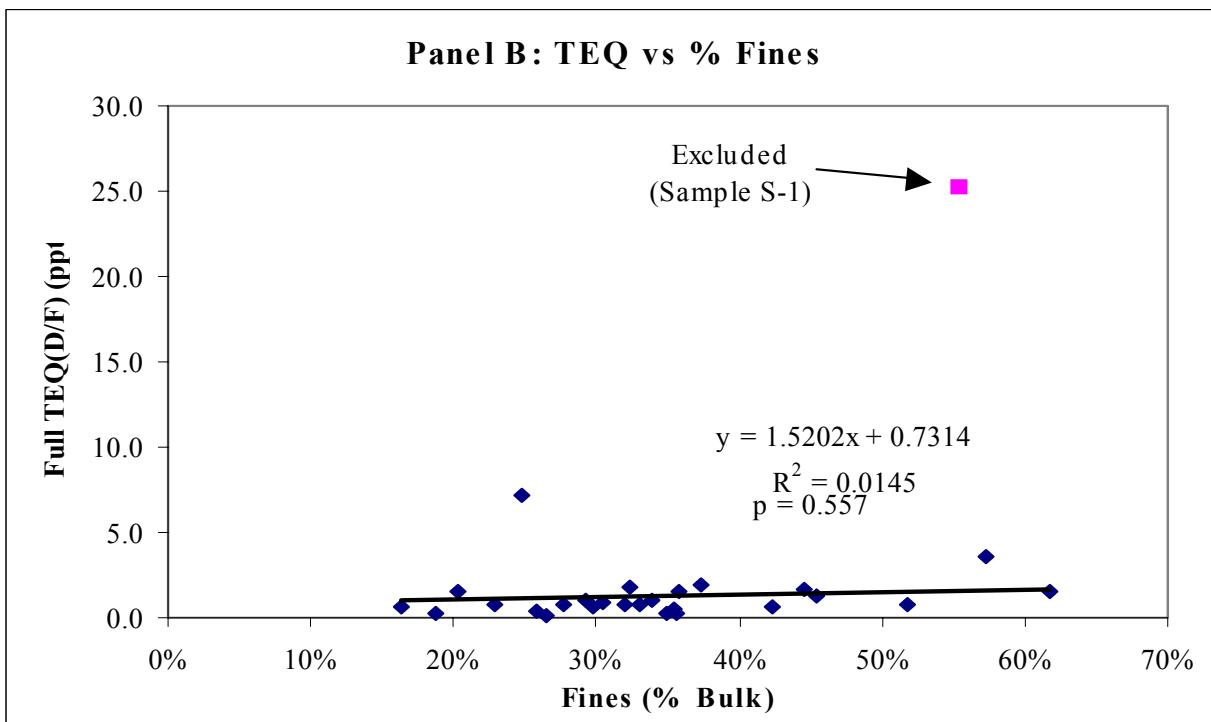
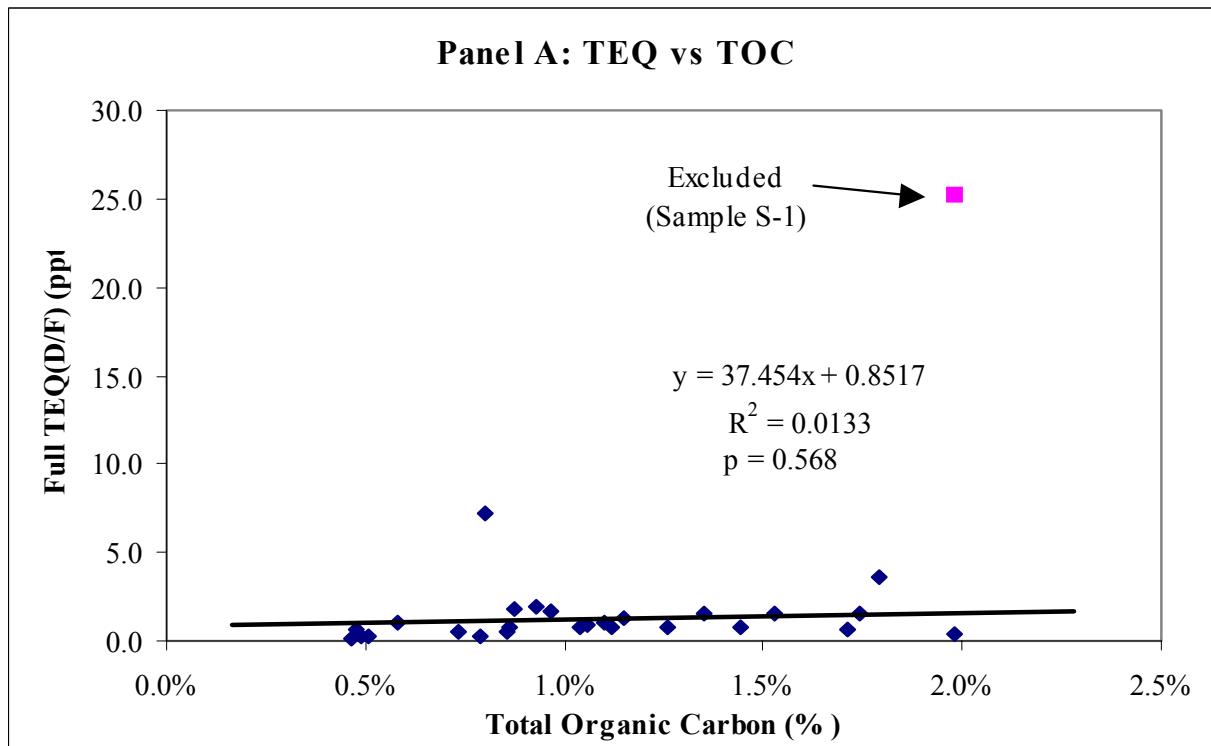
Figure 4. Average Congener Concentration Profile in Random RMA Soils

Figure 5. Dependence of TEQ on Soil Characteristics

regression line through the data is not statistically different from zero ($p > 0.5$), and the coefficient of determination is very low ($R^2 = 0.013$). This indicates that TOC is not a significant determinant of TEQ, at least in these soil samples.

Figure 5 (Panel B) shows the relation between Full TEQ(D/F) and the mass fraction of the raw field sample that passes a fine screen. As above, the slope of the best-fit linear regression line is not statistically different from zero ($p > 0.5$), and the coefficient of determination is very low ($R^2 = 0.0145$). This indicates that the fraction of fine particles in a soil is not a significant determinant of TEQ levels, at least in these soil samples.

5.0 SUMMARY AND CONCLUSIONS

The concentration of dioxins is low in most samples of soil collected from random locations at RMA, although small elevations are observable in some samples collected from areas close to the former chemical manufacturing operations (the South Plants area). The distribution of values across the site is not statistically different from values observed in open space and agricultural areas around the Denver front range area, and all of the on-site values are far below a level of health concern to on-site workers. It should also be noted that the South Plants area of RMA is scheduled for soil remediation due to the presence of organochlorine pesticide contamination, and once this remediation is complete, it is expected that dioxin levels throughout RMA will be approximately the same as for open space areas in the Denver Front Range area and will present no significant health risk to future Refuge workers, volunteers, or visitors.

6.0 REFERENCES

- De Rosa CT, Brown D, Dhara R, Garrett W, Hansen H, Holler J, Jones D, Jordan-Izaguirre D, O'Conner R, Pohl H, Xintaras C. 1997. Dioxin and Dioxin-Like Compounds in Soil, Part 1: ATSDR Interim Policy Guideline. *Toxicol. Ind. Health* 13:759-768.
- EBASCO. 1994. Final Integrated Endangerment Assessment/ Risk Characterization (IEA/RC). Version 4.2. July 1994.
- Gannett Fleming. 1999. Review of Former Sampling Programs at Rocky Mountain Arsenal, Colorado. Memo from Karen Prochnow, Gannett Fleming, Inc., to Laura Williams, USEPA Region 8. March 19, 1999.
- Rogowski, D, Golding, S, Bowhay, D, and Singleton, S. 1999. Screening survey for metals and dioxins in fertilizer products and soils in Washington State. Report prepared for the Washington State Department of Ecology. Ecology Publication No. 99-309. April 1999.
- USEPA. 1989. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part A). United States Environmental Protection Agency, Office of Emergency and Remedial Response. EPA/540/1-89/002. December 1989.
- USEPA. 1992. Guidance for Data Useability for Risk Assessment (Part A). U. S. Environmental Protection Agency, Office of Emergency and Remedial Response. Publication 9285.7-09A. April, 1992.
- USEPA. 1994. Health Assessment Document for 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD) and Related Compounds. Volume III of III. Office of Health and Environmental Assessment Office of Research and Development. External Review Draft. August 1994. EPA/600/BP-92/001c.
- USEPA. 1998. Approach for Addressing Dioxins in Soil at CERCLA and RCRA Sites. Memo from Timothy Fields Jr. April 13, 1998. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response. OSWER Directive 9200.4-26.
- USEPA. 1999. Quality Assurance Project Plan for the Denver Front Range Dioxin Study. Prepared by USEPA Region 8 with technical input from ISSI Consulting Group, Inc., and Gannett Fleming, Inc. December, 1999.
- USEPA. 2000. Interim Final Draft: Exposure and Health Assessment for 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds. United States Environmental Protection Agency, National Center for Environmental Assessment (NCEA). May 1, 2000.

USEPA. 2001a. Denver Front Range Study. Dioxins in Surface Soil. Study 3: Western Tier Parcel, Rocky Mountain Arsenal. Report prepared by USEPA Region 8 with technical assistance from Syracuse Research Corporation, Inc. and Gannett Fleming, Inc. July, 2001.

USEPA. 2001b. Denver Front Range Study. Dioxins in Surface Soil. Study 2: Characterization of Dioxins, Furans and PCBs in Random Soil Samples Collected from the Rocky Mountain Arsenal. Report prepared by USEPA Region 8 with technical assistance from Syracuse Research Corporation, Inc. and Gannett Fleming, Inc. July, 2001.

USEPA. 2001c. Denver Front Range Study. Dioxins in Surface Soil. Study 1: Characterization of Dioxins, Furans and PCBs In Soil Samples Collected from the Denver Front Range Area. Report prepared by USEPA Region 8 with technical assistance from Syracuse Research Corporation, Inc. and Gannett Fleming, Inc. July, 2001.

Van den Berg M, Birnbaum L, Bosveld ATC, Brunström B, Cook P, Feeley M, Giesy JP, Hanberg A, Hasegawa R, Kennedy SW, Kubiak T, Larsen JC, van Leeuwen FXR, Liem AKD, Nolt C, Peterson RE, Poellinger L, Safe S, Schrenk D, Tillitt D, Tysklind M, Younes M, Wærn F, Zacharewski T. 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife. Environmental Health Perspectives 106:775-792.

APPENDIX A

RAW ANALYTICAL DATA AND CALCULATION OF TEQ VALUES

APPENDIX A1

Results for Field Samples

APPENDIX A2

Results for the QC Samples

APPENDIX A1. Field Results

FINAL

Sample ID	463	Field		S1								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.821	3.284	2.07	NJ		1.035		0.1	0.1		0.4%	0.0%
2,3,7,8-TCDD	0.0871	0.3484		--		0.04355		1	0.0		0.2%	0.0%
1,2,3,7,8-PeCDF	0.0544	0.2176	23.1	--		23.1	23.1	0.05	1.2	1.2	4.4%	4.6%
2,3,4,7,8-PeCDF	0.0404	0.1616	3.12	--		3.12	3.12	0.5	1.6	1.6	6.0%	6.2%
1,2,3,7,8-PeCDD	0.0431	0.1724	0.673	--		0.673	0.673	1	0.7	0.7	2.6%	2.7%
1,2,3,4,7,8-HxCDF	0.232	0.928	71.8	--		71.8	71.8	0.1	7.2	7.2	27.5%	28.7%
1,2,3,6,7,8-HxCDF	0.206	0.824	27	--		27	27	0.1	2.7	2.7	10.3%	10.8%
2,3,4,6,7,8-HxCDF	0.298	1.192	12.4	--		12.4	12.4	0.1	1.2	1.2	4.7%	4.9%
1,2,3,7,8,9-HxCDF	0.502	2.008	22.1	--		22.1	22.1	0.1	2.2	2.2	8.5%	8.8%
1,2,3,4,7,8-HxCDD	0.748	2.992		E	<5x*B	0.374		0.1	0.0		0.1%	0.0%
1,2,3,6,7,8-HxCDD	0.0325	0.13	1.02	--		1.02	1.02	0.1	0.1	0.1	0.4%	0.4%
1,2,3,7,8,9-HxCDD	1.04	4.16		E		0.52		0.1	0.1		0.2%	0.0%
1,2,3,4,6,7,8-HpCDF	0.234	0.936	458	--		458	458	0.01	4.6	4.6	17.5%	18.3%
1,2,3,4,7,8,9-HpCDF	0.529	2.116	251	--		251	251	0.01	2.5	2.5	9.6%	10.0%
1,2,3,4,6,7,8-HpCDD	0.195	0.78	17.4	--		17.4	17.4	0.01	0.2	0.2	0.7%	0.7%
OCDF	0.0855	0.342	9630	CJ		9630	4815	0.0001	1.0	0.5	3.7%	1.9%
OCDD	0.151	0.604	134	--		134	134	0.0001	0.0	0.0	0.1%	0.1%
PCB-77	0.12	0.48	22.7	--		22.7	22.7	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.11	0.44	1.2	B	<5x*B	1.2	0.6	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	1.35	5.4	491	CJ		491	245.5	0.0001	0.0	0.0	0.2%	0.1%
PCB-114	1.34	5.36	31.2	--		31.2	31.2	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	1.12	4.48	1130	CJ		1130	565	0.0001	0.1	0.1	0.4%	0.2%
PCB-123	1.26	5.04		--		0.63		0.0001	0.0		0.0%	0.0%
PCB-126	1.94	7.76	5.3	--		5.3	2.65	0.1	0.5	0.3	2.0%	1.1%
PCB-156	0.636	2.544	163	--		163	163	0.0005	0.1	0.1	0.3%	0.3%
PCB-157	0.671	2.684	39.6	--		39.6	39.6	0.0005	0.0	0.0	0.1%	0.1%
PCB-167	0.618	2.472	64.1	--		64.1	64.1	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.102	0.408	0.921	--		0.921	0.921	0.01	0.0	0.0	0.0%	0.0%
PCB-189	0.937	3.748	14	--		14	14	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
25.3	24.6	0.8	0.5	26.1	25.1

APPENDIX A1. Field Results

FINAL

Sample ID	318	Field		S11								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0589	0.2356	0.375	NJ		0.1875		0.1	0.0		1.1%	0.0%
2,3,7,8-TCDD	0.0316	0.1264		--		0.0158		1	0.0		1.0%	0.0%
1,2,3,7,8-PeCDF	0.0928	0.3712	1.01	--		1.01	1.01	0.05	0.1	0.1	3.1%	3.5%
2,3,4,7,8-PeCDF	0.0685	0.274	0.413	--		0.413	0.413	0.5	0.2	0.2	12.6%	14.4%
1,2,3,7,8-PeCDD	0.0456	0.1824		--		0.0228		1	0.0		1.4%	0.0%
1,2,3,4,7,8-HxCDF	0.0515	0.206	1.42	--		1.42	1.42	0.1	0.1	0.1	8.7%	9.9%
1,2,3,6,7,8-HxCDF	0.0472	0.1888	0.919	B	<5x*B	0.919	0.4595	0.1	0.1	0.0	5.6%	3.2%
2,3,4,6,7,8-HxCDF	0.0544	0.2176		--		0.0272		0.1	0.0		0.2%	0.0%
1,2,3,7,8,9-HxCDF	0.0651	0.2604	0.615	--		0.615	0.615	0.1	0.1	0.1	3.8%	4.3%
1,2,3,4,7,8-HxCDD	0.518	2.072		E		0.259		0.1	0.0		1.6%	0.0%
1,2,3,6,7,8-HxCDD	0.689	2.756		E		0.3445		0.1	0.0		2.1%	0.0%
1,2,3,7,8,9-HxCDD	0.0267	0.1068	0.703	J		0.703	0.3515	0.1	0.1	0.0	4.3%	2.4%
1,2,3,4,6,7,8-HpCDF	0.0414	0.1656	5.79	--		5.79	5.79	0.01	0.1	0.1	3.5%	4.0%
1,2,3,4,7,8,9-HpCDF	0.0652	0.2608	1.68	--		1.68	1.68	0.01	0.0	0.0	1.0%	1.2%
1,2,3,4,6,7,8-HpCDD	0.0536	0.2144	17.7	--		17.7	17.7	0.01	0.2	0.2	10.8%	12.3%
OCDF	0.0447	0.1788	24	--		24	24	0.0001	0.0	0.0	0.1%	0.2%
OCDD	0.0355	0.142	143	--		143	143	0.0001	0.0	0.0	0.9%	1.0%
PCB-77	0.0862	0.3448	16.8	--		16.8	16.8	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.0973	0.3892	0.996	B	<5x*B	0.996	0.498	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	2.27	9.08	65.1	--		65.1	65.1	0.0001	0.0	0.0	0.4%	0.5%
PCB-114	2.37	9.48		--	<5x*B	1.185		0.0005	0.0		0.0%	0.0%
PCB-118	2.51	10.04	134	--		134	134	0.0001	0.0	0.0	0.8%	0.9%
PCB-123	2.85	11.4	4.15	--		4.15	2.075	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.053	0.212	5.75	--		5.75	5.75	0.1	0.6	0.6	35.1%	40.0%
PCB-156	0.324	1.296	29	--		29	29	0.0005	0.0	0.0	0.9%	1.0%
PCB-157	0.335	1.34	8.13	--		8.13	8.13	0.0005	0.0	0.0	0.2%	0.3%
PCB-167	0.33	1.32	15.8	--		15.8	15.8	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0678	0.2712	0.984	--		0.984	0.984	0.01	0.0	0.0	0.6%	0.7%
PCB-189	0.223	0.892	4.43	--		4.43	4.43	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.0	0.8	0.6	0.6	1.6	1.4

Sample ID	567	Field		S12								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.034	0.136	0.24	NJ		0.12		0.1	0.0		1.1%	0.0%
2,3,7,8-TCDD	0.0281	0.1124		--		0.01405		1	0.0		1.3%	0.0%
1,2,3,7,8-PeCDF	0.0835	0.334	0.59	--		0.59	0.59	0.05	0.0	0.0	2.8%	4.3%
2,3,4,7,8-PeCDF	0.242	0.968		E		0.121		0.5	0.1		5.7%	0.0%
1,2,3,7,8-PeCDD	0.328	1.312		E		0.164		1	0.2		15.5%	0.0%
1,2,3,4,7,8-HxCDF	0.0628	0.2512	0.881	--		0.881	0.881	0.1	0.1	0.1	8.3%	12.7%
1,2,3,6,7,8-HxCDF	0.0559	0.2236	0.58	B	<5x*B	0.58	0.29	0.1	0.1	0.0	5.5%	4.2%
2,3,4,6,7,8-HxCDF	0.0609	0.2436	0.551	--		0.551	0.551	0.1	0.1	0.1	5.2%	8.0%
1,2,3,7,8,9-HxCDF	0.472	1.888		E		0.236		0.1	0.0		2.2%	0.0%
1,2,3,4,7,8-HxCDD	0.328	1.312		E		0.164		0.1	0.0		1.6%	0.0%
1,2,3,6,7,8-HxCDD	0.343	1.372		E		0.1715		0.1	0.0		1.6%	0.0%
1,2,3,7,8,9-HxCDD	0.00726	0.0290	0.348	J		0.348	0.174	0.1	0.0	0.0	3.3%	2.5%
1,2,3,4,6,7,8-HpCDF	0.0197	0.0788	3.48	--		3.48	3.48	0.01	0.0	0.0	3.3%	5.0%
1,2,3,4,7,8,9-HpCDF	0.0266	0.1064	1.04	--		1.04	1.04	0.01	0.0	0.0	1.0%	1.5%
1,2,3,4,6,7,8-HpCDD	0.0215	0.086	8.33	--		8.33	8.33	0.01	0.1	0.1	7.9%	12.1%
OCDF	0.0113	0.0452	17	--		17	17	0.0001	0.0	0.0	0.2%	0.2%
OCDD	0.0239	0.0956	70.1	--		70.1	70.1	0.0001	0.0	0.0	0.7%	1.0%
PCB-77	0.0422	0.1688	13.7	--		13.7	13.7	0.0001	0.0	0.0	0.1%	0.2%
PCB-81	0.0521	0.2084	0.764	B	<5x*B	0.764	0.382	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.734	2.936	49.1	B	<5x*B	49.1	24.55	0.0001	0.0	0.0	0.5%	0.4%
PCB-114	0.767	3.068	2.27	B	<5x*B	2.27	0.5675	0.0005	0.0	0.0	0.1%	0.0%
PCB-118	0.78	3.12	96.3	B	<5x*B	96.3	48.15	0.0001	0.0	0.0	0.9%	0.7%
PCB-123	0.886	3.544		--	<5x*B	0.443		0.0001	0.0		0.0%	0.0%
PCB-126	0.0824	0.3296	3.14	--		3.14	3.14	0.1	0.3	0.3	29.7%	45.4%
PCB-156	0.329	1.316	20.4	--		20.4	20.4	0.0005	0.0	0.0	1.0%	1.5%
PCB-157	0.34	1.36	5	B	<5x*B	5	2.5	0.0005	0.0	0.0	0.2%	0.2%
PCB-167	0.335	1.34	11	--		11	11	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.402	1.608		E		0.201		0.01	0.0		0.2%	0.0%
PCB-189	0.312	1.248	4.11	--		4.11	4.11	0.0001	0.0	0.0	0.0%	0.1%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.7	0.4	0.3	0.3	1.1	0.7

Sample ID	187	Field		S19								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0312	0.1248	0.294	NJ		0.147		0.1	0.0		0.7%	0.0%
2,3,7,8-TCDD	0.0178	0.0712		--		0.0089		1	0.0		0.4%	0.0%
1,2,3,7,8-PeCDF	0.623	2.492		E		0.3115		0.05	0.0		0.8%	0.0%
2,3,4,7,8-PeCDF	0.044	0.176	0.493	--		0.493	0.493	0.5	0.2	0.2	12.1%	12.6%
1,2,3,7,8-PeCDD	0.0219	0.0876	0.375	--		0.375	0.375	1	0.4	0.4	18.4%	19.2%
1,2,3,4,7,8-HxCDF	0.0534	0.2136	0.983	--		0.983	0.983	0.1	0.1	0.1	4.8%	5.0%
1,2,3,6,7,8-HxCDF	0.0468	0.1872	0.67	--		0.67	0.67	0.1	0.1	0.1	3.3%	3.4%
2,3,4,6,7,8-HxCDF	0.052	0.208	0.652	--		0.652	0.652	0.1	0.1	0.1	3.2%	3.3%
1,2,3,7,8,9-HxCDF	0.0581	0.2324	0.5	B	<5x*B	0.5	0.25	0.1	0.1	0.0	2.5%	1.3%
1,2,3,4,7,8-HxCDD	0.368	1.472		E		0.184		0.1	0.0		0.9%	0.0%
1,2,3,6,7,8-HxCDD	0.0145	0.058	0.533	--		0.533	0.533	0.1	0.1	0.1	2.6%	2.7%
1,2,3,7,8,9-HxCDD	0.0157	0.0628	0.628	--		0.628	0.628	0.1	0.1	0.1	3.1%	3.2%
1,2,3,4,6,7,8-HpCDF	0.0161	0.0644	4.61	--		4.61	4.61	0.01	0.0	0.0	2.3%	2.4%
1,2,3,4,7,8,9-HpCDF	0.0204	0.0816	1.05	--		1.05	1.05	0.01	0.0	0.0	0.5%	0.5%
1,2,3,4,6,7,8-HpCDD	0.049	0.196	13.2	--		13.2	13.2	0.01	0.1	0.1	6.5%	6.8%
OCDF	0.0161	0.0644	19	--		19	19	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.00776	0.0310	97.6	--		97.6	97.6	0.0001	0.0	0.0	0.5%	0.5%
PCB-77	0.0698	0.2792	29.5	--		29.5	29.5	0.0001	0.0	0.0	0.1%	0.2%
PCB-81	0.0725	0.29	1.13	B	<5x*B	1.13	0.565	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	3.06	12.24	183	--		183	183	0.0001	0.0	0.0	0.9%	0.9%
PCB-114	3.04	12.16	7.94	--		7.94	3.97	0.0005	0.0	0.0	0.2%	0.1%
PCB-118	2.62	10.48	354	--		354	354	0.0001	0.0	0.0	1.7%	1.8%
PCB-123	2.95	11.8	8.28	J		8.28	2.07	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.0986	0.3944	6.5	--		6.5	6.5	0.1	0.7	0.7	31.9%	33.3%
PCB-156	0.436	1.744	64.2	--		64.2	64.2	0.0005	0.0	0.0	1.6%	1.6%
PCB-157	0.459	1.836	15.8	--		15.8	15.8	0.0005	0.0	0.0	0.4%	0.4%
PCB-167	0.423	1.692	28.2	J		28.2	14.1	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0454	0.1816	0.774	--		0.774	0.774	0.01	0.0	0.0	0.4%	0.4%
PCB-189	0.0926	0.3704	9.31	--		9.31	9.31	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.3	1.2	0.8	0.8	2.0	2.0

APPENDIX A1. Field Results

FINAL

Sample ID	429	Field		S2								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.374	1.496	1.23	NJ		0.615		0.1	0.1		0.7%	0.0%
2,3,7,8-TCDD	0.0718	0.2872	1.38	--		1.38	1.38	1	1.4	1.4	16.6%	17.0%
1,2,3,7,8-PeCDF	0.0246	0.0984	5.15	--		5.15	5.15	0.05	0.3	0.3	3.1%	3.2%
2,3,4,7,8-PeCDF	0.02	0.08	1.53	--		1.53	1.53	0.5	0.8	0.8	9.2%	9.4%
1,2,3,7,8-PeCDD	0.0105	0.042	0.799	--		0.799	0.799	1	0.8	0.8	9.6%	9.8%
1,2,3,4,7,8-HxCDF	0.0449	0.1796	9.3	--		9.3	9.3	0.1	0.9	0.9	11.2%	11.5%
1,2,3,6,7,8-HxCDF	0.0386	0.1544	4.46	--		4.46	4.46	0.1	0.4	0.4	5.3%	5.5%
2,3,4,6,7,8-HxCDF	0.047	0.188	2.22	--		2.22	2.22	0.1	0.2	0.2	2.7%	2.7%
1,2,3,7,8,9-HxCDF	0.0501	0.2004	2.14	B	<5x*B	2.14	1.07	0.1	0.2	0.1	2.6%	1.3%
1,2,3,4,7,8-HxCDD	0.0348	0.1392	1.38	--		1.38	1.38	0.1	0.1	0.1	1.7%	1.7%
1,2,3,6,7,8-HxCDD	0.0312	0.1248	3.04	--		3.04	3.04	0.1	0.3	0.3	3.6%	3.7%
1,2,3,7,8,9-HxCDD	0.0341	0.1364	2.51	--		2.51	2.51	0.1	0.3	0.3	3.0%	3.1%
1,2,3,4,6,7,8-HpCDF	0.0217	0.0868	38.8	--		38.8	38.8	0.01	0.4	0.4	4.7%	4.8%
1,2,3,4,7,8,9-HpCDF	0.0282	0.1128	9.37	--		9.37	9.37	0.01	0.1	0.1	1.1%	1.2%
1,2,3,4,6,7,8-HpCDD	0.0583	0.2332	84.2	--		84.2	84.2	0.01	0.8	0.8	10.1%	10.4%
OCDF	0.0222	0.0888	152	--		152	152	0.0001	0.0	0.0	0.2%	0.2%
OCDD	0.0229	0.0916	785	--		785	785	0.0001	0.1	0.1	0.9%	1.0%
PCB-77	0.0878	0.3512	40.7	--		40.7	40.7	0.0001	0.0	0.0	0.0%	0.1%
PCB-81	0.082	0.328	1.64	B	<5x*B	1.64	0.82	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.553	2.212	462	--		462	462	0.0001	0.0	0.0	0.6%	0.6%
PCB-114	0.55	2.2	23.7	--		23.7	23.7	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.471	1.884	1010	CJ		1010	505	0.0001	0.1	0.1	1.2%	0.6%
PCB-123	0.529	2.116	--		0.2645			0.0001	0.0		0.0%	0.0%
PCB-126	1.03	4.12	8.85	--		8.85	8.85	0.1	0.9	0.9	10.6%	10.9%
PCB-156	0.44	1.76	143	--		143	143	0.0005	0.1	0.1	0.9%	0.9%
PCB-157	0.464	1.856	36.2	--		36.2	36.2	0.0005	0.0	0.0	0.2%	0.2%
PCB-167	0.427	1.708	58.7	--		58.7	58.7	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0483	0.1932	1.24	--		1.24	1.24	0.01	0.0	0.0	0.1%	0.2%
PCB-189	0.298	1.192	13.8	--		13.8	13.8	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
7.2	7.0	1.2	1.1	8.3	8.1

Sample ID	291	Field		S20								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.08	0.32	0.131	NJ		0.0655		0.1	0.0		0.7%	0.0%
2,3,7,8-TCDD	0.0489	0.1956		--		0.02445		1	0.0		2.8%	0.0%
1,2,3,7,8-PeCDF	0.0355	0.142	0.21	--		0.21	0.21	0.05	0.0	0.0	1.2%	1.9%
2,3,4,7,8-PeCDF	0.189	0.756		E		0.0945		0.5	0.0		5.4%	0.0%
1,2,3,7,8-PeCDD	0.383	1.532		E		0.1915		1	0.2		21.7%	0.0%
1,2,3,4,7,8-HxCDF	0.0437	0.1748	0.527	--		0.527	0.527	0.1	0.1	0.1	6.0%	9.5%
1,2,3,6,7,8-HxCDF	0.0373	0.1492	0.434	--		0.434	0.434	0.1	0.0	0.0	4.9%	7.8%
2,3,4,6,7,8-HxCDF	0.0411	0.1644	0.349	B	<5x*B	0.349	0.1745	0.1	0.0	0.0	4.0%	3.1%
1,2,3,7,8,9-HxCDF	0.0464	0.1856	0.422	B	<5x*B	0.422	0.211	0.1	0.0	0.0	4.8%	3.8%
1,2,3,4,7,8-HxCDD	0.176	0.704		E		0.088		0.1	0.0		1.0%	0.0%
1,2,3,6,7,8-HxCDD	0.0341	0.1364	0.492	--		0.492	0.492	0.1	0.0	0.0	5.6%	8.9%
1,2,3,7,8,9-HxCDD	0.037	0.148	0.6	--		0.6	0.6	0.1	0.1	0.1	6.8%	10.8%
1,2,3,4,6,7,8-HpCDF	0.0265	0.106	3.79	--		3.79	3.79	0.01	0.0	0.0	4.3%	6.8%
1,2,3,4,7,8,9-HpCDF	0.0374	0.1496	0.957	--		0.957	0.957	0.01	0.0	0.0	1.1%	1.7%
1,2,3,4,6,7,8-HpCDD	0.0223	0.0892	5.42	--		5.42	5.42	0.01	0.1	0.1	6.1%	9.8%
OCDF	0.0127	0.0508	20.6	--		20.6	20.6	0.0001	0.0	0.0	0.2%	0.4%
OCDD	0.0254	0.1016	41	--		41	41	0.0001	0.0	0.0	0.5%	0.7%
PCB-77	0.296	1.184	6.95	B	<5x*B	6.95	3.475	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.337	1.348	1.05	B	<5x*B	1.05	0.2625	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.991	3.964	36	B	<5x*B	36	18	0.0001	0.0	0.0	0.4%	0.3%
PCB-114	0.984	3.936	1.16	--		1.16	0.58	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.824	3.296	84.9	B	<5x*B	84.9	42.45	0.0001	0.0	0.0	1.0%	0.8%
PCB-123	0.927	3.708	2.43	BJ	<5x*B	2.43	0.6075	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.154	0.616	1.79	--		1.79	1.79	0.1	0.2	0.2	20.3%	32.3%
PCB-156	0.137	0.548	11.9	B	<5x*B	11.9	5.95	0.0005	0.0	0.0	0.7%	0.5%
PCB-157	4.52	18.08		E	<5x*B	2.26		0.0005	0.0		0.1%	0.0%
PCB-167	0.133	0.532	6.18	BJ	<5x*B	6.18	3.09	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0798	0.3192	0.361	--		0.361	0.361	0.01	0.0	0.0	0.4%	0.7%
PCB-189	1.77	7.08		E		0.885		0.0001	0.0		0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.7	0.4	0.2	0.2	0.9	0.6

APPENDIX A1. Field Results

FINAL

Sample ID	644	Field		S22								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.04	0.16	0.202	NJ		0.101		0.1	0.0		0.9%	0.0%
2,3,7,8-TCDD	0.00136	0.0054		--	0.00068			1	0.0		0.1%	0.0%
1,2,3,7,8-PeCDF	0.249	0.996		E		0.1245		0.05	0.0		0.6%	0.0%
2,3,4,7,8-PeCDF	0.0126	0.0504	0.327	--		0.327	0.327	0.5	0.2	0.2	15.2%	20.3%
1,2,3,7,8-PeCDD	0.276	1.104		E		0.138		1	0.1		12.9%	0.0%
1,2,3,4,7,8-HxCDF	0.0258	0.1032	0.4	B	<5x*B	0.4	0.2	0.1	0.0	0.0	3.7%	2.5%
1,2,3,6,7,8-HxCDF	0.0216	0.0864	0.411	--		0.411	0.411	0.1	0.0	0.0	3.8%	5.1%
2,3,4,6,7,8-HxCDF	0.0246	0.0984	0.306	B	<5x*B	0.306	0.153	0.1	0.0	0.0	2.9%	1.9%
1,2,3,7,8,9-HxCDF	0.391	1.564		E	<5x*B	0.1955		0.1	0.0		1.8%	0.0%
1,2,3,4,7,8-HxCDD	0.011	0.044	0.283	--		0.283	0.283	0.1	0.0	0.0	2.6%	3.5%
1,2,3,6,7,8-HxCDD	0.768	3.072		E		0.384		0.1	0.0		3.6%	0.0%
1,2,3,7,8,9-HxCDD	0.0109	0.0436	1.02	--		1.02	1.02	0.1	0.1	0.1	9.5%	12.7%
1,2,3,4,6,7,8-HpCDF	0.0482	0.1928	2.29	--		2.29	2.29	0.01	0.0	0.0	2.1%	2.8%
1,2,3,4,7,8,9-HpCDF	0.377	1.508		E		0.1885		0.01	0.0		0.2%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0164	0.0656	8.12	--		8.12	8.12	0.01	0.1	0.1	7.6%	10.1%
OCDF	0.0102	0.0408	6.28	--		6.28	6.28	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.00731	0.0292	61.2	--		61.2	61.2	0.0001	0.0	0.0	0.6%	0.8%
PCB-77	0.192	0.768	12.9	B	<5x*B	12.9	6.45	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.213	0.852	0.859	B	<5x*B	0.859	0.4295	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.652	2.608	52.8	B	<5x*B	52.8	26.4	0.0001	0.0	0.0	0.5%	0.3%
PCB-114	0.648	2.592	2.41	--		2.41	1.205	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.651	2.604	123	B	<5x*B	123	61.5	0.0001	0.0	0.0	1.2%	0.8%
PCB-123	0.732	2.928	2.83	BJ	<5x*B	2.83	0.7075	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.15	0.6	3.05	--		3.05	3.05	0.1	0.3	0.3	28.4%	37.8%
PCB-156	0.066	0.264	18.4	B	<5x*B	18.4	9.2	0.0005	0.0	0.0	0.9%	0.6%
PCB-157	0.0696	0.2784	5.3	B	<5x*B	5.3	2.65	0.0005	0.0	0.0	0.3%	0.2%
PCB-167	0.0641	0.2564	9.9	J		9.9	4.95	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0449	0.1796	0.409	--		0.409	0.409	0.01	0.0	0.0	0.4%	0.5%
PCB-189	0.00751	0.0300	2.18	--		2.18	2.18	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.7	0.5	0.3	0.3	1.1	0.8

Sample ID	521	Field		S23								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0539	0.2156	--		0.02695		0.1	0.0			0.6%	0.0%
2,3,7,8-TCDD	0.0178	0.0712	--		0.0089		1	0.0			1.9%	0.0%
1,2,3,7,8-PeCDF	0.144	0.576	E		0.072		0.05	0.0			0.8%	0.0%
2,3,4,7,8-PeCDF	0.012	0.048	--		0.006		0.5	0.0			0.7%	0.0%
1,2,3,7,8-PeCDD	0.0254	0.1016	--		0.0127		1	0.0			2.8%	0.0%
1,2,3,4,7,8-HxCDF	0.0318	0.1272	0.138	B	<5x*B	0.138	0.069	0.1	0.0	0.0	3.0%	2.4%
1,2,3,6,7,8-HxCDF	0.0286	0.1144	0.265	--		0.265	0.265	0.1	0.0	0.0	5.8%	9.3%
2,3,4,6,7,8-HxCDF	0.033	0.132	--	<5x*B	0.0165		0.1	0.0			0.4%	0.0%
1,2,3,7,8,9-HxCDF	0.04	0.16	0.378	B	<5x*B	0.378	0.189	0.1	0.0	0.0	8.2%	6.6%
1,2,3,4,7,8-HxCDD	0.2	0.8	E		0.1		0.1	0.0			2.2%	0.0%
1,2,3,6,7,8-HxCDD	0.986	3.944	E		0.493		0.1	0.0			10.7%	0.0%
1,2,3,7,8,9-HxCDD	0.0107	0.0428	1.44	--	1.44	1.44	0.1	0.1	0.1	0.1	31.3%	50.4%
1,2,3,4,6,7,8-HpCDF	0.0317	0.1268	0.746	--	0.746	0.746	0.01	0.0	0.0	0.0	1.6%	2.6%
1,2,3,4,7,8,9-HpCDF	0.149	0.596	E		0.0745		0.01	0.0			0.2%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0174	0.0696	2.36	--	2.36	2.36	0.01	0.0	0.0	0.0	5.1%	8.3%
OCDF	0.0143	0.0572	2.11	B	<5x*B	2.11	1.055	0.0001	0.0	0.0	0.0%	0.0%
OCDD	0.0234	0.0936	16	--		16	16	0.0001	0.0	0.0	0.3%	0.6%
PCB-77	0.188	0.752	4.54	B	<5x*B	4.54	2.27	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.228	0.912	0.641	B	<5x*B	0.641	0.16025	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.333	1.332	23.8	B	<5x*B	23.8	11.9	0.0001	0.0	0.0	0.5%	0.4%
PCB-114	0.331	1.324	1.46	--		1.46	1.46	0.0005	0.0	0.0	0.2%	0.3%
PCB-118	0.288	1.152	54.6	B	<5x*B	54.6	27.3	0.0001	0.0	0.0	1.2%	1.0%
PCB-123	0.323	1.292	--	<5x*B	0.1615		0.0001	0.0			0.0%	0.0%
PCB-126	0.134	0.536	0.986	B	<5x*B	0.986	0.493	0.1	0.1	0.0	21.4%	17.2%
PCB-156	0.218	0.872	6.06	B	<5x*B	6.06	3.03	0.0005	0.0	0.0	0.7%	0.5%
PCB-157	1.98	7.92	E	<5x*B	0.99		0.0005	0.0			0.1%	0.0%
PCB-167	0.212	0.848	3.09	BJ	<5x*B	3.09	1.545	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.053	0.212	0.186	--		0.186	0.093	0.01	0.0	0.0	0.4%	0.3%
PCB-189	0.0488	0.1952	0.861	--		0.861	0.861	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.3	0.2	0.1	0.1	0.5	0.3

Sample ID	385	Field		S24								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0591	0.2364	0.289	NJ		0.1445		0.1	0.0		2.8%	0.0%
2,3,7,8-TCDD	0.0243	0.0972		--		0.01215		1	0.0		2.3%	0.0%
1,2,3,7,8-PeCDF	0.0272	0.1088	0.516	--		0.516	0.516	0.05	0.0	0.0	4.9%	7.5%
2,3,4,7,8-PeCDF	0.2	0.8		E		0.1		0.5	0.1		9.6%	0.0%
1,2,3,7,8-PeCDD	0.0214	0.0856		--		0.0107		1	0.0		2.0%	0.0%
1,2,3,4,7,8-HxCDF	0.0366	0.1464	0.379	B	<5x*B	0.379	0.1895	0.1	0.0	0.0	7.3%	5.5%
1,2,3,6,7,8-HxCDF	0.3	1.2		E		0.15		0.1	0.0		2.9%	0.0%
2,3,4,6,7,8-HxCDF	0.0358	0.1432	0.313	B	<5x*B	0.313	0.1565	0.1	0.0	0.0	6.0%	4.6%
1,2,3,7,8,9-HxCDF	0.325	1.3		E	<5x*B	0.1625		0.1	0.0		3.1%	0.0%
1,2,3,4,7,8-HxCDD	0.213	0.852		E		0.1065		0.1	0.0		2.0%	0.0%
1,2,3,6,7,8-HxCDD	0.0111	0.0444	0.259	--		0.259	0.259	0.1	0.0	0.0	5.0%	7.6%
1,2,3,7,8,9-HxCDD	0.012	0.048	0.329	--		0.329	0.329	0.1	0.0	0.0	6.3%	9.6%
1,2,3,4,6,7,8-HpCDF	0.0166	0.0664	1.38	--		1.38	1.38	0.01	0.0	0.0	2.6%	4.0%
1,2,3,4,7,8,9-HpCDF	0.0231	0.0924	0.371	--		0.371	0.371	0.01	0.0	0.0	0.7%	1.1%
1,2,3,4,6,7,8-HpCDD	0.016	0.064	4.12	--		4.12	4.12	0.01	0.0	0.0	7.9%	12.0%
OCDF	0.0188	0.0752	4.67	--		4.67	4.67	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.0116	0.0464	28.1	--		28.1	28.1	0.0001	0.0	0.0	0.5%	0.8%
PCB-77	0.131	0.524	5.98	B	<5x*B	5.98	2.99	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.147	0.588	0.704	B	<5x*B	0.704	0.352	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.956	3.824	53.7	B	<5x*B	53.7	26.85	0.0001	0.0	0.0	1.0%	0.8%
PCB-114	2.14	8.56		E		1.07		0.0005	0.0		0.1%	0.0%
PCB-118	0.818	3.272	122	B	<5x*B	122	61	0.0001	0.0	0.0	2.3%	1.8%
PCB-123	0.92	3.68		--	<5x*B	0.46		0.0001	0.0		0.0%	0.0%
PCB-126	0.11	0.44	1.46	--		1.46	1.46	0.1	0.1	0.1	27.9%	42.6%
PCB-156	0.212	0.848	16.8	B	<5x*B	16.8	8.4	0.0005	0.0	0.0	1.6%	1.2%
PCB-157	0.224	0.896	4.27	B	<5x*B	4.27	2.135	0.0005	0.0	0.0	0.4%	0.3%
PCB-167	0.206	0.824	7.18	BJ	<5x*B	7.18	3.59	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0544	0.2176	0.192	--		0.192	0.096	0.01	0.0	0.0	0.4%	0.3%
PCB-189	0.287	1.148	2.55	--		2.55	2.55	0.0001	0.0	0.0	0.0%	0.1%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.3	0.2	0.2	0.2	0.5	0.3

Sample ID	847	Field		S25								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0169	0.0676	0.384	NJ		0.192		0.1	0.0		10.9%	0.0%
2,3,7,8-TCDD	0.00563	0.0225		--		0.002815		1	0.0		1.6%	0.0%
1,2,3,7,8-PeCDF	0.428	1.712		E		0.214		0.05	0.0		6.1%	0.0%
2,3,4,7,8-PeCDF	0.193	0.772		E		0.0965		0.5	0.0		27.4%	0.0%
1,2,3,7,8-PeCDD	0.00418	0.0167		--		0.00209		1	0.0		1.2%	0.0%
1,2,3,4,7,8-HxCDF	0.167	0.668		E		0.0835		0.1	0.0		4.8%	0.0%
1,2,3,6,7,8-HxCDF	0.175	0.7		E	<5x*B	0.0875		0.1	0.0		5.0%	0.0%
2,3,4,6,7,8-HxCDF	0.0534	0.2136		--		0.0267		0.1	0.0		1.5%	0.0%
1,2,3,7,8,9-HxCDF	0.323	1.292		E		0.1615		0.1	0.0		9.2%	0.0%
1,2,3,4,7,8-HxCDD	0.00325	0.013		--		0.001625		0.1	0.0		0.1%	0.0%
1,2,3,6,7,8-HxCDD	0.00275	0.011		--		0.001375		0.1	0.0		0.1%	0.0%
1,2,3,7,8,9-HxCDD	0.00306	0.0122		J		0.00153		0.1	0.0		0.1%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0606	0.2424	0.417	B	<5x*B	0.417	0.2085	0.01	0.0	0.0	2.4%	9.3%
1,2,3,4,7,8,9-HpCDF	0.125	0.5		--		0.0625		0.01	0.0		0.4%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0375	0.15	1.37	--		1.37	1.37	0.01	0.0	0.0	7.8%	61.3%
OCDF	0.0765	0.306	1.02	--		1.02	1.02	0.0001	0.0	0.0	0.1%	0.5%
OCDD	0.0656	0.2624	10.3	--		10.3	10.3	0.0001	0.0	0.0	0.6%	4.6%
PCB-77	0.0349	0.1396	3.67	B	<5x*B	3.67	1.835	0.0001	0.0	0.0	0.2%	0.8%
PCB-81	0.0471	0.1884	0.561	B	<5x*B	0.561	0.2805	0.0001	0.0	0.0	0.0%	0.1%
PCB-105	0.449	1.796	18.8	B	<5x*B	18.8	9.4	0.0001	0.0	0.0	1.1%	4.2%
PCB-114	1.17	4.68		E	<5x*B	0.585		0.0005	0.0		0.2%	0.0%
PCB-118	0.479	1.916	42.2	B	<5x*B	42.2	21.1	0.0001	0.0	0.0	2.4%	9.4%
PCB-123	0.545	2.18		--	<5x*B	0.2725		0.0001	0.0		0.0%	0.0%
PCB-126	0.5	2		E		0.25		0.1	0.0		14.2%	0.0%
PCB-156	0.189	0.756	6.7	B	<5x*B	6.7	3.35	0.0005	0.0	0.0	1.9%	7.5%
PCB-157	0.195	0.78	1.79	B	<5x*B	1.79	0.895	0.0005	0.0	0.0	0.5%	2.0%
PCB-167	0.192	0.768	3.05	B	<5x*B	3.05	1.525	0.00001	0.0	0.0	0.0%	0.1%
PCB-169	0.12	0.48		E		0.06		0.01	0.0		0.3%	0.0%
PCB-189	0.174	0.696	0.478	--		0.478	0.239	0.0001	0.0	0.0	0.0%	0.1%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.1	0.0	0.0	0.0	0.2	0.0

Sample ID	547	Field		S26								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0152	0.0608	0.184	NJ		0.092		0.1	0.0		0.9%	0.0%
2,3,7,8-TCDD	0.00255	0.0102		--		0.001275		1	0.0		0.1%	0.0%
1,2,3,7,8-PeCDF	0.0098	0.0392	1.17	--		1.17	1.17	0.05	0.1	0.1	5.5%	7.3%
2,3,4,7,8-PeCDF	0.00738	0.0295	0.231	--		0.231	0.231	0.5	0.1	0.1	10.9%	14.4%
1,2,3,7,8-PeCDD	0.00196	0.0078		--		0.00098		1	0.0		0.1%	0.0%
1,2,3,4,7,8-HxCDF	0.0212	0.0848	1.62	--		1.62	1.62	0.1	0.2	0.2	15.2%	20.3%
1,2,3,6,7,8-HxCDF	0.0182	0.0728	1.15	--		1.15	1.15	0.1	0.1	0.1	10.8%	14.4%
2,3,4,6,7,8-HxCDF	0.0201	0.0804	0.493	B	<5x*B	0.493	0.2465	0.1	0.0	0.0	4.6%	3.1%
1,2,3,7,8,9-HxCDF	0.0224	0.0896	0.728	B	<5x*B	0.728	0.364	0.1	0.1	0.0	6.8%	4.6%
1,2,3,4,7,8-HxCDD	0.225	0.9		E		0.1125		0.1	0.0		1.1%	0.0%
1,2,3,6,7,8-HxCDD	0.331	1.324		E		0.1655		0.1	0.0		1.6%	0.0%
1,2,3,7,8,9-HxCDD	0.274	1.096		E		0.137		0.1	0.0		1.3%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0244	0.0976	4.42	--		4.42	4.42	0.01	0.0	0.0	4.2%	5.5%
1,2,3,4,7,8,9-HpCDF	0.0295	0.118	2.15	--		2.15	2.15	0.01	0.0	0.0	2.0%	2.7%
1,2,3,4,6,7,8-HpCDD	0.00354	0.0142	6.53	--		6.53	6.53	0.01	0.1	0.1	6.1%	8.2%
OCDF	0.00593	0.0237	21	--		21	21	0.0001	0.0	0.0	0.2%	0.3%
OCDD	0.00107	0.0043	51.4	--		51.4	51.4	0.0001	0.0	0.0	0.5%	0.6%
PCB-77	0.0321	0.1284	9.12	B	<5x*B	9.12	4.56	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.0334	0.1336	0.6	B	<5x*B	0.6	0.3	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.172	0.688	58	B	<5x*B	58	29	0.0001	0.0	0.0	0.5%	0.4%
PCB-114	0.171	0.684	3.03	--		3.03	3.03	0.0005	0.0	0.0	0.1%	0.2%
PCB-118	0.156	0.624	122	B	<5x*B	122	61	0.0001	0.0	0.0	1.1%	0.8%
PCB-123	0.176	0.704	1.63	B	<5x*B	1.63	0.815	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.116	0.464	2.62	J		2.62	1.31	0.1	0.3	0.1	24.6%	16.4%
PCB-156	0.159	0.636	21.9	B	<5x*B	21.9	10.95	0.0005	0.0	0.0	1.0%	0.7%
PCB-157	0.168	0.672	5.79	B	<5x*B	5.79	2.895	0.0005	0.0	0.0	0.3%	0.2%
PCB-167	0.155	0.62	9.08	B	<5x*B	9.08	4.54	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.38	1.52		E		0.19		0.01	0.0		0.2%	0.0%
PCB-189	0.0748	0.2992	2.51	--		2.51	2.51	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.8	0.7	0.3	0.1	1.1	0.8

APPENDIX A1. Field Results

FINAL

Sample ID	768	Field		S27								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0597	0.2388	--		0.02985		0.1	0.0			0.7%	0.0%
2,3,7,8-TCDD	0.00158	0.0063	--		0.00079		1	0.0			0.2%	0.0%
1,2,3,7,8-PeCDF	0.00904	0.0362	--		0.00452		0.05	0.0			0.1%	0.0%
2,3,4,7,8-PeCDF	0.0068	0.0272	--		0.0034		0.5	0.0			0.4%	0.0%
1,2,3,7,8-PeCDD	0.00284	0.0114	--		0.00142		1	0.0			0.3%	0.0%
1,2,3,4,7,8-HxCDF	0.0188	0.0752	0.141	B	<5x*B	0.141	0.0705	0.1	0.0	0.0	3.3%	2.5%
1,2,3,6,7,8-HxCDF	0.0166	0.0664	0.173	--		0.173	0.173	0.1	0.0	0.0	4.0%	6.1%
2,3,4,6,7,8-HxCDF	0.168	0.672	E	<5x*B	0.084		0.1	0.0			2.0%	0.0%
1,2,3,7,8,9-HxCDF	0.0211	0.0844	0.286	B	<5x*B	0.286	0.143	0.1	0.0	0.0	6.6%	5.0%
1,2,3,4,7,8-HxCDD	0.00085	0.0034	0.184	--		0.184	0.184	0.1	0.0	0.0	4.3%	6.5%
1,2,3,6,7,8-HxCDD	0.00088	0.0035	0.281	--		0.281	0.281	0.1	0.0	0.0	6.5%	9.9%
1,2,3,7,8,9-HxCDD	0.0009	0.0036	0.275	--		0.275	0.275	0.1	0.0	0.0	6.4%	9.7%
1,2,3,4,6,7,8-HpCDF	0.0203	0.0812	1.13	--		1.13	1.13	0.01	0.0	0.0	2.6%	4.0%
1,2,3,4,7,8,9-HpCDF	0.022	0.088	0.186	--		0.186	0.186	0.01	0.0	0.0	0.4%	0.7%
1,2,3,4,6,7,8-HpCDD	0.00617	0.0247	4.59	--		4.59	4.59	0.01	0.0	0.0	10.6%	16.1%
OCDF	0.00997	0.0399	2.81	--		2.81	2.81	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.00121	0.0048	33.9	--		33.9	33.9	0.0001	0.0	0.0	0.8%	1.2%
PCB-77	2.59	10.36	7.24	B	<5x*B	7.24	1.81	0.0001	0.0	0.0	0.2%	0.1%
PCB-81	2.65	10.6	--		<5x*B	1.325		0.0001	0.0		0.0%	0.0%
PCB-105	0.214	0.856	23.6	B	<5x*B	23.6	11.8	0.0001	0.0	0.0	0.6%	0.4%
PCB-114	0.213	0.852	1.22	--		1.22	1.22	0.0005	0.0	0.0	0.1%	0.2%
PCB-118	0.191	0.764	46.5	B	<5x*B	46.5	23.25	0.0001	0.0	0.0	1.1%	0.8%
PCB-123	0.215	0.86	--		<5x*B	0.1075		0.0001	0.0		0.0%	0.0%
PCB-126	0.0782	0.3128	2.02	J		2.02	1.01	0.1	0.2	0.1	46.8%	35.5%
PCB-156	0.165	0.66	11.2	B	<5x*B	11.2	5.6	0.0005	0.0	0.0	1.3%	1.0%
PCB-157	0.174	0.696	2.75	B	<5x*B	2.75	1.375	0.0005	0.0	0.0	0.3%	0.2%
PCB-167	0.161	0.644	3.77	B	<5x*B	3.77	1.885	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.293	1.172	E			0.1465		0.01	0.0		0.3%	0.0%
PCB-189	0.072	0.288	1.3	--		1.3	1.3	0.0001	0.0	0.0	0.0%	0.1%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.2	0.2	0.2	0.1	0.4	0.3

Sample ID	264	Field		S28								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0316	0.1264	0.442	NJ		0.221		0.1	0.0		0.8%	0.0%
2,3,7,8-TCDD	0.00193	0.0077	--		0.000965			1	0.0		0.0%	0.0%
1,2,3,7,8-PeCDF	0.0101	0.0404	0.535	--		0.535	0.535	0.05	0.0	0.0	1.0%	1.4%
2,3,4,7,8-PeCDF	0.00807	0.0323	0.799	--		0.799	0.799	0.5	0.4	0.4	14.5%	20.6%
1,2,3,7,8-PeCDD	0.404	1.616	--	E		0.202		1	0.2		7.4%	0.0%
1,2,3,4,7,8-HxCDF	0.0315	0.126	0.879	--		0.879	0.879	0.1	0.1	0.1	3.2%	4.5%
1,2,3,6,7,8-HxCDF	0.026	0.104	0.606	--		0.606	0.606	0.1	0.1	0.1	2.2%	3.1%
2,3,4,6,7,8-HxCDF	0.0296	0.1184	0.881	--		0.881	0.881	0.1	0.1	0.1	3.2%	4.5%
1,2,3,7,8,9-HxCDF	0.0322	0.1288	0.513	B	<5x*B	0.513	0.2565	0.1	0.1	0.0	1.9%	1.3%
1,2,3,4,7,8-HxCDD	0.00112	0.0045	0.618	--		0.618	0.618	0.1	0.1	0.1	2.2%	3.2%
1,2,3,6,7,8-HxCDD	0.00106	0.0042	0.92	--		0.92	0.92	0.1	0.1	0.1	3.3%	4.8%
1,2,3,7,8,9-HxCDD	0.00112	0.0045	0.974	--		0.974	0.974	0.1	0.1	0.1	3.5%	5.0%
1,2,3,4,6,7,8-HpCDF	0.0329	0.1316	6.34	--		6.34	6.34	0.01	0.1	0.1	2.3%	3.3%
1,2,3,4,7,8,9-HpCDF	0.0424	0.1696	0.885	--		0.885	0.885	0.01	0.0	0.0	0.3%	0.5%
1,2,3,4,6,7,8-HpCDD	0.0343	0.1372	23.3	--		23.3	23.3	0.01	0.2	0.2	8.5%	12.0%
OCDF	0.0091	0.0364	15.6	--		15.6	15.6	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.00688	0.0275	180	--		180	180	0.0001	0.0	0.0	0.7%	0.9%
PCB-77	0.0897	0.3588	59.1	--		59.1	59.1	0.0001	0.0	0.0	0.2%	0.3%
PCB-81	0.0956	0.3824	2.07	B	<5x*B	2.07	1.035	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.497	1.988	178	--		178	178	0.0001	0.0	0.0	0.6%	0.9%
PCB-114	0.494	1.976	6.82	--		6.82	6.82	0.0005	0.0	0.0	0.1%	0.2%
PCB-118	0.412	1.648	316	--		316	316	0.0001	0.0	0.0	1.2%	1.6%
PCB-123	0.463	1.852	--	<5x*B	0.2315			0.0001	0.0		0.0%	0.0%
PCB-126	0.06	0.24	11.2	J		11.2	5.6	0.1	1.1	0.6	40.8%	28.9%
PCB-156	0.402	1.608	64.8	--		64.8	64.8	0.0005	0.0	0.0	1.2%	1.7%
PCB-157	0.424	1.696	16	--		16	16	0.0005	0.0	0.0	0.3%	0.4%
PCB-167	0.39	1.56	24.2	--		24.2	24.2	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.00883	0.0353	1.17	--		1.17	1.17	0.01	0.0	0.0	0.4%	0.6%
PCB-189	0.331	1.324	8.26	--		8.26	8.26	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.5	1.3	1.2	0.7	2.7	1.9

APPENDIX A1. Field Results

FINAL

Sample ID	443	Field		S29									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.154	0.616		E		0.077		0.1	0.0		1.8%	0.0%	
2,3,7,8-TCDD	0.00467	0.0187		--		0.002335		1	0.0		0.5%	0.0%	
1,2,3,7,8-PeCDF	0.27	1.08		E		0.135		0.05	0.0		1.6%	0.0%	
2,3,4,7,8-PeCDF	0.0327	0.1308		--		0.01635		0.5	0.0		1.9%	0.0%	
1,2,3,7,8-PeCDD	0.00807	0.0323		--		0.004035		1	0.0		0.9%	0.0%	
1,2,3,4,7,8-HxCDF	0.0507	0.2028	0.466	--		0.466	0.466	0.1	0.0	0.0	10.7%	14.0%	
1,2,3,6,7,8-HxCDF	0.429	1.716		E	<5x*B	0.2145		0.1	0.0		4.9%	0.0%	
2,3,4,6,7,8-HxCDF	0.285	1.14		E		0.1425		0.1	0.0		3.3%	0.0%	
1,2,3,7,8,9-HxCDF	0.0646	0.2584	0.499	--		0.499	0.499	0.1	0.0	0.0	11.5%	15.0%	
1,2,3,4,7,8-HxCDD	0.00933	0.0373	0.289	--		0.289	0.289	0.1	0.0	0.0	6.7%	8.7%	
1,2,3,6,7,8-HxCDD	0.00698	0.0279	0.36	--		0.36	0.36	0.1	0.0	0.0	8.3%	10.8%	
1,2,3,7,8,9-HxCDD	0.271	1.084		EJ		0.1355		0.1	0.0		3.1%	0.0%	
1,2,3,4,6,7,8-HpCDF	1.88	7.52		E	<5x*B	0.94		0.01	0.0		2.2%	0.0%	
1,2,3,4,7,8,9-HpCDF	0.591	2.364		E		0.2955		0.01	0.0		0.7%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.0515	0.206	4.27	--		4.27	4.27	0.01	0.0	0.0	9.8%	12.8%	
OCDF	0.0373	0.1492	6.93	--		6.93	6.93	0.0001	0.0	0.0	0.2%	0.2%	
OCDD	0.0416	0.1664	29.8	--		29.8	29.8	0.0001	0.0	0.0	0.7%	0.9%	
PCB-77	0.0547	0.2188	6.53	B	<5x*B	6.53	3.265	0.0001	0.0	0.0	0.2%	0.1%	
PCB-81	0.0599	0.2396	0.713	B	<5x*B	0.713	0.3565	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.465	1.86	31.6	B	<5x*B	31.6	15.8	0.0001	0.0	0.0	0.7%	0.5%	
PCB-114	0.486	1.944	1.53	B	<5x*B	1.53	0.3825	0.0005	0.0	0.0	0.2%	0.1%	
PCB-118	0.484	1.936	63.6	B	<5x*B	63.6	31.8	0.0001	0.0	0.0	1.5%	1.0%	
PCB-123	0.55	2.2	1.93	B	<5x*B	1.93	0.4825	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.0634	0.2536	1.16	--		1.16	1.16	0.1	0.1	0.1	26.7%	34.8%	
PCB-156	0.323	1.292	9.14	B	<5x*B	9.14	4.57	0.0005	0.0	0.0	1.1%	0.7%	
PCB-157	0.334	1.336	2.67	B	<5x*B	2.67	1.335	0.0005	0.0	0.0	0.3%	0.2%	
PCB-167	0.328	1.312	5	B	<5x*B	5	2.5	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0504	0.2016	0.239	J		0.239	0.1195	0.01	0.0	0.0	0.6%	0.4%	
PCB-189	0.16	0.64	1.19	--		1.19	1.19	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.3	0.2	0.1	0.1	0.4	0.3

APPENDIX A1. Field Results**FINAL**

Sample ID	641	Field		S3									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.094	0.376	--		0.047		0.1	0.0			0.5%	0.0%	
2,3,7,8-TCDD	0.00649	0.026	--		0.003245		1	0.0			0.3%	0.0%	
1,2,3,7,8-PeCDF	0.0224	0.0896	0.65	--	0.65	0.65	0.05	0.0	0.0	0.0	3.2%	4.2%	
2,3,4,7,8-PeCDF	0.0176	0.0704	0.355	--	0.355	0.355	0.5	0.2	0.2	0.2	17.7%	22.9%	
1,2,3,7,8-PeCDD	0.00863	0.0345	--		0.004315		1	0.0			0.4%	0.0%	
1,2,3,4,7,8-HxCDF	0.0822	0.3288	0.972	--	0.972	0.972	0.1	0.1	0.1	0.1	9.7%	12.6%	
1,2,3,6,7,8-HxCDF	0.0763	0.3052	0.603	I	0.603	0.603	0.1	0.1	0.1	0.1	6.0%	7.8%	
2,3,4,6,7,8-HxCDF	0.14	0.56	--	<5x*B	0.07		0.1	0.0			0.7%	0.0%	
1,2,3,7,8,9-HxCDF	0.233	0.932	0.502	B	<5x*B	0.502	0.1255	0.1	0.1	0.0	5.0%	1.6%	
1,2,3,4,7,8-HxCDD	0.0319	0.1276	0.324	--	0.324	0.324	0.1	0.0	0.0	0.0	3.2%	4.2%	
1,2,3,6,7,8-HxCDD	0.035	0.14	0.328	--	0.328	0.328	0.1	0.0	0.0	0.0	3.3%	4.2%	
1,2,3,7,8,9-HxCDD	0.0349	0.1396	--		0.01745		0.1	0.0			0.2%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.0489	0.1956	4.48	--	4.48	4.48	0.01	0.0	0.0	0.0	4.5%	5.8%	
1,2,3,4,7,8,9-HpCDF	0.0939	0.3756	1.76	--	1.76	1.76	0.01	0.0	0.0	0.0	1.8%	2.3%	
1,2,3,4,6,7,8-HpCDD	0.119	0.476	8.09	--	8.09	8.09	0.01	0.1	0.1	0.1	8.1%	10.4%	
OCDF	0.0481	0.1924	26.4	--	26.4	26.4	0.0001	0.0	0.0	0.0	0.3%	0.3%	
OCDD	0.0923	0.3692	63.4	--	63.4	63.4	0.0001	0.0	0.0	0.0	0.6%	0.8%	
PCB-77	0.333	1.332	13.3	B	<5x*B	13.3	6.65	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	0.353	1.412	0.983	B	<5x*B	0.983	0.24575	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.497	1.988	59.3	B	<5x*B	59.3	29.65	0.0001	0.0	0.0	0.6%	0.4%	
PCB-114	0.493	1.972	2.42	--	2.42	2.42	0.0005	0.0	0.0	0.0	0.1%	0.2%	
PCB-118	0.42	1.68	115	B	<5x*B	115	57.5	0.0001	0.0	0.0	1.1%	0.7%	
PCB-123	0.473	1.892	4.82	B	<5x*B	4.82	2.41	0.0001	0.0	0.0	0.1%	0.0%	
PCB-126	0.0819	0.3276	3.11	J	3.11	1.555	0.1	0.3	0.2	0.2	30.9%	20.1%	
PCB-156	0.168	0.672	21.1	B	<5x*B	21.1	10.55	0.0005	0.0	0.0	1.1%	0.7%	
PCB-157	0.177	0.708	5.48	B	<5x*B	5.48	2.74	0.0005	0.0	0.0	0.3%	0.2%	
PCB-167	0.163	0.652	8.05	B	<5x*B	8.05	4.025	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0289	0.1156	0.391	--	0.391	0.391	0.01	0.0	0.0	0.0	0.4%	0.5%	
PCB-189	0.139	0.556	2.12	--	2.12	2.12	0.0001	0.0	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.7	0.6	0.3	0.2	1.0	0.8

APPENDIX A1. Field Results

FINAL

Sample ID	736	Field		S30								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.175	0.7		E		0.0875		0.1	0.0		1.3%	0.0%
2,3,7,8-TCDD	0.00344	0.0138		--		0.00172		1	0.0		0.3%	0.0%
1,2,3,7,8-PeCDF	0.0552	0.2208	0.335	--		0.335	0.335	0.05	0.0	0.0	2.5%	4.4%
2,3,4,7,8-PeCDF	0.0365	0.146	0.185	--		0.185	0.185	0.5	0.1	0.1	13.7%	24.2%
1,2,3,7,8-PeCDD	0.364	1.456		E		0.182		1	0.2		27.0%	0.0%
1,2,3,4,7,8-HxCDF	0.436	1.744		E		0.218		0.1	0.0		3.2%	0.0%
1,2,3,6,7,8-HxCDF	0.0231	0.0924	0.311	B	<5x*B	0.311	0.1555	0.1	0.0	0.0	4.6%	4.1%
2,3,4,6,7,8-HxCDF	0.263	1.052		E		0.1315		0.1	0.0		2.0%	0.0%
1,2,3,7,8,9-HxCDF	0.0552	0.2208	0.495	--		0.495	0.495	0.1	0.0	0.0	7.4%	12.9%
1,2,3,4,7,8-HxCDD	0.0232	0.0928	0.171	--		0.171	0.171	0.1	0.0	0.0	2.5%	4.5%
1,2,3,6,7,8-HxCDD	0.322	1.288		E		0.161		0.1	0.0		2.4%	0.0%
1,2,3,7,8,9-HxCDD	0.215	0.86		EJ		0.1075		0.1	0.0		1.6%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0249	0.0996	1.85	B	<5x*B	1.85	0.925	0.01	0.0	0.0	2.8%	2.4%
1,2,3,4,7,8,9-HpCDF	0.543	2.172		E		0.2715		0.01	0.0		0.4%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0242	0.0968	3.81	--		3.81	3.81	0.01	0.0	0.0	5.7%	10.0%
OCDF	0.0287	0.1148	6.58	--		6.58	6.58	0.0001	0.0	0.0	0.1%	0.2%
OCDD	0.0317	0.1268	25.5	--		25.5	25.5	0.0001	0.0	0.0	0.4%	0.7%
PCB-77	0.0664	0.2656	6.17	B	<5x*B	6.17	3.085	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.0692	0.2768	0.612	B	<5x*B	0.612	0.306	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.647	2.588	21	B	<5x*B	21	10.5	0.0001	0.0	0.0	0.3%	0.3%
PCB-114	0.676	2.704	1.26	B	<5x*B	1.26	0.315	0.0005	0.0	0.0	0.1%	0.0%
PCB-118	0.79	3.16	51.4	B	<5x*B	51.4	25.7	0.0001	0.0	0.0	0.8%	0.7%
PCB-123	0.898	3.592	1.4	B	<5x*B	1.4	0.35	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.097	0.388	1.33	--		1.33	1.33	0.1	0.1	0.1	19.8%	34.7%
PCB-156	0.278	1.112	7.54	B	<5x*B	7.54	3.77	0.0005	0.0	0.0	0.6%	0.5%
PCB-157	0.288	1.152	2.31	B	<5x*B	2.31	1.155	0.0005	0.0	0.0	0.2%	0.2%
PCB-167	0.283	1.132	4.53	B	<5x*B	4.53	2.265	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0244	0.0976	0.247	J		0.247	0.1235	0.01	0.0	0.0	0.4%	0.3%
PCB-189	0.143	0.572	1.25	--		1.25	1.25	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.5	0.2	0.1	0.1	0.7	0.4

APPENDIX A1. Field Results**FINAL**

Sample ID	616	Field		S31									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0726	0.2904	0.502	NJ		0.251		0.1	0.0		1.1%	0.0%	
2,3,7,8-TCDD	0.00242	0.0097	--		0.00121			1	0.0		0.1%	0.0%	
1,2,3,7,8-PeCDF	0.021	0.084	3.29	--		3.29	3.29	0.05	0.2	0.2	7.0%	8.1%	
2,3,4,7,8-PeCDF	0.492	1.968	--	E		0.246		0.5	0.1		5.3%	0.0%	
1,2,3,7,8-PeCDD	0.217	0.868	--	E		0.1085		1	0.1		4.6%	0.0%	
1,2,3,4,7,8-HxCDF	0.0439	0.1756	5.02	--		5.02	5.02	0.1	0.5	0.5	21.4%	24.6%	
1,2,3,6,7,8-HxCDF	0.0396	0.1584	2.91	--		2.91	2.91	0.1	0.3	0.3	12.4%	14.2%	
2,3,4,6,7,8-HxCDF	0.0486	0.1944	1.64	--		1.64	1.64	0.1	0.2	0.2	7.0%	8.0%	
1,2,3,7,8,9-HxCDF	0.0587	0.2348	1.51	--		1.51	1.51	0.1	0.2	0.2	6.4%	7.4%	
1,2,3,4,7,8-HxCDD	0.411	1.644	--	E		0.2055		0.1	0.0		0.9%	0.0%	
1,2,3,6,7,8-HxCDD	0.0137	0.0548	0.44	--		0.44	0.44	0.1	0.0	0.0	1.9%	2.2%	
1,2,3,7,8,9-HxCDD	0.0151	0.0604	0.387	J		0.387	0.1935	0.1	0.0	0.0	1.7%	1.0%	
1,2,3,4,6,7,8-HpCDF	0.0336	0.1344	16.6	--		16.6	16.6	0.01	0.2	0.2	7.1%	8.1%	
1,2,3,4,7,8,9-HpCDF	0.0486	0.1944	6.15	--		6.15	6.15	0.01	0.1	0.1	2.6%	3.0%	
1,2,3,4,6,7,8-HpCDD	0.02	0.08	7.73	--		7.73	7.73	0.01	0.1	0.1	3.3%	3.8%	
OCDF	0.0138	0.0552	91.2	--		91.2	91.2	0.0001	0.0	0.0	0.4%	0.5%	
OCDD	0.0229	0.0916	51.7	--		51.7	51.7	0.0001	0.0	0.0	0.2%	0.3%	
PCB-77	0.0175	0.07	14.2	--		14.2	14.2	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	0.0211	0.0844	0.851	B	<5x*B	0.851	0.4255	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.756	3.024	159	--		159	159	0.0001	0.0	0.0	0.7%	0.8%	
PCB-114	0.79	3.16	7.54	--		7.54	7.54	0.0005	0.0	0.0	0.2%	0.2%	
PCB-118	0.809	3.236	352	--		352	352	0.0001	0.0	0.0	1.5%	1.7%	
PCB-123	0.92	3.68	6.83	--		6.83	6.83	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.122	0.488	3.02	--		3.02	3.02	0.1	0.3	0.3	12.9%	14.8%	
PCB-156	0.315	1.26	43.9	--		43.9	43.9	0.0005	0.0	0.0	0.9%	1.1%	
PCB-157	0.326	1.304	11.6	--		11.6	11.6	0.0005	0.0	0.0	0.3%	0.3%	
PCB-167	0.32	1.28	19.1	--		19.1	19.1	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0376	0.1504	0.435	J		0.435	0.2175	0.01	0.0	0.0	0.2%	0.1%	
PCB-189	0.185	0.74	3.44	--		3.44	3.44	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
2.0	1.7	0.4	0.4	2.3	2.0

APPENDIX A1. Field Results

FINAL

Sample ID	945	Field		S32								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.208	0.832		E		0.104		0.1	0.0		1.0%	0.0%
2,3,7,8-TCDD	0.0045	0.018		--		0.00225		1	0.0		0.2%	0.0%
1,2,3,7,8-PeCDF	0.0201	0.0804	0.474	--		0.474	0.474	0.05	0.0	0.0	2.3%	3.1%
2,3,4,7,8-PeCDF	0.0125	0.05	0.21	--		0.21	0.21	0.5	0.1	0.1	10.0%	13.8%
1,2,3,7,8-PeCDD	0.37	1.48		E		0.185		1	0.2		17.7%	0.0%
1,2,3,4,7,8-HxCDF	0.0191	0.0764	0.594	--		0.594	0.594	0.1	0.1	0.1	5.7%	7.8%
1,2,3,6,7,8-HxCDF	0.0184	0.0736	0.505	B	<5x*B	0.505	0.2525	0.1	0.1	0.0	4.8%	3.3%
2,3,4,6,7,8-HxCDF	0.0193	0.0772	0.414	--		0.414	0.414	0.1	0.0	0.0	4.0%	5.4%
1,2,3,7,8,9-HxCDF	0.0228	0.0912	0.566	--		0.566	0.566	0.1	0.1	0.1	5.4%	7.4%
1,2,3,4,7,8-HxCDD	0.366	1.464		E		0.183		0.1	0.0		1.8%	0.0%
1,2,3,6,7,8-HxCDD	0.0132	0.0528	0.683	--		0.683	0.683	0.1	0.1	0.1	6.5%	9.0%
1,2,3,7,8,9-HxCDD	0.0148	0.0592	0.639	J		0.639	0.3195	0.1	0.1	0.0	6.1%	4.2%
1,2,3,4,6,7,8-HpCDF	0.0296	0.1184	2.95	--		2.95	2.95	0.01	0.0	0.0	2.8%	3.9%
1,2,3,4,7,8,9-HpCDF	0.0413	0.1652	0.716	--		0.716	0.716	0.01	0.0	0.0	0.7%	0.9%
1,2,3,4,6,7,8-HpCDD	0.0277	0.1108	6.98	--		6.98	6.98	0.01	0.1	0.1	6.7%	9.2%
OCDF	0.0223	0.0892	11.7	--		11.7	11.7	0.0001	0.0	0.0	0.1%	0.2%
OCDD	0.0261	0.1044	51	--		51	51	0.0001	0.0	0.0	0.5%	0.7%
PCB-77	0.0331	0.1324	11	B	<5x*B	11	5.5	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.0433	0.1732	0.902	B	<5x*B	0.902	0.451	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.82	3.28	60.7	--		60.7	60.7	0.0001	0.0	0.0	0.6%	0.8%
PCB-114	0.857	3.428	2.82	B	<5x*B	2.82	0.705	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.898	3.592	121	B	<5x*B	121	60.5	0.0001	0.0	0.0	1.2%	0.8%
PCB-123	1.02	4.08	3.51	B	<5x*B	3.51	0.8775	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.113	0.452	2.16	--		2.16	2.16	0.1	0.2	0.2	20.6%	28.3%
PCB-156	0.319	1.276	16.4	--		16.4	16.4	0.0005	0.0	0.0	0.8%	1.1%
PCB-157	0.329	1.316	4.27	B	<5x*B	4.27	2.135	0.0005	0.0	0.0	0.2%	0.1%
PCB-167	0.324	1.296	8.04	--		8.04	8.04	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.273	1.092		E		0.1365		0.01	0.0		0.1%	0.0%
PCB-189	0.222	0.888	1.55	--		1.55	1.55	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.8	0.5	0.2	0.2	1.0	0.8

APPENDIX A1. Field Results**FINAL**

Sample ID	564	Field		S33									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0717	0.2868	0.193	NJ		0.0965		0.1	0.0		0.6%	0.0%	
2,3,7,8-TCDD	0.00328	0.0131	--			0.00164		1	0.0		0.1%	0.0%	
1,2,3,7,8-PeCDF	0.00136	0.0054	0.274	--		0.274	0.274	0.05	0.0	0.0	0.8%	1.4%	
2,3,4,7,8-PeCDF	0.00104	0.0042	0.376	--		0.376	0.376	0.5	0.2	0.2	11.6%	19.1%	
1,2,3,7,8-PeCDD	0.291	1.164	--	E		0.1455		1	0.1		9.0%	0.0%	
1,2,3,4,7,8-HxCDF	0.0664	0.2656	0.385	B	<5x*B	0.385	0.1925	0.1	0.0	0.0	2.4%	2.0%	
1,2,3,6,7,8-HxCDF	0.307	1.228	--	E		0.1535		0.1	0.0		0.9%	0.0%	
2,3,4,6,7,8-HxCDF	0.0594	0.2376	0.477	B	<5x*B	0.477	0.2385	0.1	0.0	0.0	3.0%	2.4%	
1,2,3,7,8,9-HxCDF	0.0669	0.2676	0.405	B	<5x*B	0.405	0.2025	0.1	0.0	0.0	2.5%	2.1%	
1,2,3,4,7,8-HxCDD	0.303	1.212	--	E		0.1515		0.1	0.0		0.9%	0.0%	
1,2,3,6,7,8-HxCDD	0.00641	0.0256	0.546	--		0.546	0.546	0.1	0.1	0.1	3.4%	5.5%	
1,2,3,7,8,9-HxCDD	0.00665	0.0266	0.54	--		0.54	0.54	0.1	0.1	0.1	3.3%	5.5%	
1,2,3,4,6,7,8-HpCDF	0.0262	0.1048	3.5	--		3.5	3.5	0.01	0.0	0.0	2.2%	3.6%	
1,2,3,4,7,8,9-HpCDF	0.412	1.648	--	E		0.206		0.01	0.0		0.1%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.0264	0.1056	14.2	--		14.2	14.2	0.01	0.1	0.1	8.8%	14.4%	
OCDF	0.00693	0.0277	8.94	--		8.94	8.94	0.0001	0.0	0.0	0.1%	0.1%	
OCDD	0.0134	0.0536	215	--		215	215	0.0001	0.0	0.0	1.3%	2.2%	
PCB-77	0.126	0.504	25.2	--		25.2	25.2	0.0001	0.0	0.0	0.2%	0.3%	
PCB-81	0.139	0.556	1.31	B	<5x*B	1.31	0.655	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.376	1.504	98.8	B	<5x*B	98.8	49.4	0.0001	0.0	0.0	0.6%	0.5%	
PCB-114	0.373	1.492	3.94	--		3.94	3.94	0.0005	0.0	0.0	0.1%	0.2%	
PCB-118	0.328	1.312	178	B	<5x*B	178	89	0.0001	0.0	0.0	1.1%	0.9%	
PCB-123	0.369	1.476	4.21	B	<5x*B	4.21	2.105	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.129	0.516	7.28	J		7.28	3.64	0.1	0.7	0.4	45.0%	36.9%	
PCB-156	0.265	1.06	35.2	--		35.2	35.2	0.0005	0.0	0.0	1.1%	1.8%	
PCB-157	0.28	1.12	9.18	--		9.18	9.18	0.0005	0.0	0.0	0.3%	0.5%	
PCB-167	0.258	1.032	15	--		15	15	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0292	0.1168	0.747	--		0.747	0.747	0.01	0.0	0.0	0.5%	0.8%	
PCB-189	0.157	0.628	4.47	--		4.47	4.47	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.8	0.6	0.8	0.4	1.6	1.0

APPENDIX A1. Field Results

FINAL

Sample ID	693	Field		S34								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.132	0.528	0.232	NJ		0.116		0.1	0.0		0.7%	0.0%
2,3,7,8-TCDD	0.00204	0.0082		--		0.00102		1	0.0		0.1%	0.0%
1,2,3,7,8-PeCDF	0.271	1.084		E		0.1355		0.05	0.0		0.4%	0.0%
2,3,4,7,8-PeCDF	0.00547	0.0219	0.308	--		0.308	0.308	0.5	0.2	0.2	9.2%	9.9%
1,2,3,7,8-PeCDD	0.002	0.008	0.325	--		0.325	0.325	1	0.3	0.3	19.5%	20.8%
1,2,3,4,7,8-HxCDF	0.56	2.24		E	<5x*B	0.28		0.1	0.0		1.7%	0.0%
1,2,3,6,7,8-HxCDF	0.0188	0.0752	0.328	--		0.328	0.328	0.1	0.0	0.0	2.0%	2.1%
2,3,4,6,7,8-HxCDF	0.0217	0.0868	0.426	B	<5x*B	0.426	0.213	0.1	0.0	0.0	2.6%	1.4%
1,2,3,7,8,9-HxCDF	0.0247	0.0988	0.347	B	<5x*B	0.347	0.1735	0.1	0.0	0.0	2.1%	1.1%
1,2,3,4,7,8-HxCDD	0.0231	0.0924	0.354	--		0.354	0.354	0.1	0.0	0.0	2.1%	2.3%
1,2,3,6,7,8-HxCDD	0.0223	0.0892	0.541	--		0.541	0.541	0.1	0.1	0.1	3.2%	3.5%
1,2,3,7,8,9-HxCDD	0.0236	0.0944	0.449	--		0.449	0.449	0.1	0.0	0.0	2.7%	2.9%
1,2,3,4,6,7,8-HpCDF	0.0419	0.1676	3.48	--		3.48	3.48	0.01	0.0	0.0	2.1%	2.2%
1,2,3,4,7,8,9-HpCDF	0.511	2.044		E		0.2555		0.01	0.0		0.2%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0214	0.0856	12.6	--		12.6	12.6	0.01	0.1	0.1	7.6%	8.1%
OCDF	0.0227	0.0908	8.72	--		8.72	8.72	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.018	0.072	103	--		103	103	0.0001	0.0	0.0	0.6%	0.7%
PCB-77	6.18	24.72	20.9	--		20.9	10.45	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	6.58	26.32		--	<5x*B	3.29		0.0001	0.0		0.0%	0.0%
PCB-105	2.08	8.32	81.9	B	<5x*B	81.9	40.95	0.0001	0.0	0.0	0.5%	0.3%
PCB-114	2.07	8.28	3.81	--		3.81	1.905	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	1.74	6.96	169	B	<5x*B	169	84.5	0.0001	0.0	0.0	1.0%	0.5%
PCB-123	1.96	7.84	5.15	BJ	<5x*B	5.15	1.2875	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.111	0.444	6.62	--		6.62	6.62	0.1	0.7	0.7	39.7%	42.4%
PCB-156	0.228	0.912	33.3	--		33.3	33.3	0.0005	0.0	0.0	1.0%	1.1%
PCB-157	0.24	0.96	9.53	--		9.53	9.53	0.0005	0.0	0.0	0.3%	0.3%
PCB-167	0.221	0.884	16.9	J		16.9	8.45	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.034	0.136	0.783	--		0.783	0.783	0.01	0.0	0.0	0.5%	0.5%
PCB-189	0.0743	0.2972	4.35	--		4.35	4.35	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.9	0.9	0.7	0.7	1.7	1.6

APPENDIX A1. Field Results

FINAL

Sample ID	389	Field		S35								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	1.75	7	1.04	NJ		0.4375		0.1	0.0		0.9%	0.0%
2,3,7,8-TCDD	0.0484	0.1936		--		0.0242		1	0.0		0.5%	0.0%
1,2,3,7,8-PeCDF	0.0259	0.1036	5.2	--		5.2	5.2	0.05	0.3	0.3	5.1%	6.5%
2,3,4,7,8-PeCDF	0.0203	0.0812	1.17	--		1.17	1.17	0.5	0.6	0.6	11.6%	14.7%
1,2,3,7,8-PeCDD	0.366	1.464		E		0.183		1	0.2		3.6%	0.0%
1,2,3,4,7,8-HxCDF	0.0232	0.0928	8.21	--		8.21	8.21	0.1	0.8	0.8	16.3%	20.6%
1,2,3,6,7,8-HxCDF	0.0208	0.0832	4.2	--		4.2	4.2	0.1	0.4	0.4	8.3%	10.5%
2,3,4,6,7,8-HxCDF	0.0246	0.0984	2.21	--		2.21	2.21	0.1	0.2	0.2	4.4%	5.5%
1,2,3,7,8,9-HxCDF	0.0291	0.1164	2.16	B	<5x*B	2.16	1.08	0.1	0.2	0.1	4.3%	2.7%
1,2,3,4,7,8-HxCDD	0.0313	0.1252	0.534	B	<5x*B	0.534	0.267	0.1	0.1	0.0	1.1%	0.7%
1,2,3,6,7,8-HxCDD	0.0285	0.114	0.918	--		0.918	0.918	0.1	0.1	0.1	1.8%	2.3%
1,2,3,7,8,9-HxCDD	0.031	0.124	0.764	--		0.764	0.764	0.1	0.1	0.1	1.5%	1.9%
1,2,3,4,6,7,8-HpCDF	0.0434	0.1736	23.7	--		23.7	23.7	0.01	0.2	0.2	4.7%	5.9%
1,2,3,4,7,8,9-HpCDF	0.0631	0.2524	9.81	--		9.81	9.81	0.01	0.1	0.1	1.9%	2.5%
1,2,3,4,6,7,8-HpCDD	0.0555	0.222	18.5	--		18.5	18.5	0.01	0.2	0.2	3.7%	4.6%
OCDF	0.022	0.088	142	--		142	142	0.0001	0.0	0.0	0.3%	0.4%
OCDD	0.0483	0.1932	142	--		142	142	0.0001	0.0	0.0	0.3%	0.4%
PCB-77	0.141	0.564	76.8	--		76.8	76.8	0.0001	0.0	0.0	0.2%	0.2%
PCB-81	0.142	0.568	2.92	B	<5x*B	2.92	1.46	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	1.91	7.64	406	--		406	406	0.0001	0.0	0.0	0.8%	1.0%
PCB-114	1.9	7.6	21.1	--		21.1	21.1	0.0005	0.0	0.0	0.2%	0.3%
PCB-118	1.6	6.4	809	CJ		809	404.5	0.0001	0.1	0.0	1.6%	1.0%
PCB-123	1.79	7.16		--		0.895		0.0001	0.0		0.0%	0.0%
PCB-126	6.69	26.76	12.7	--		12.7	6.35	0.1	1.3	0.6	25.1%	15.9%
PCB-156	0.823	3.292	134	--		134	134	0.0005	0.1	0.1	1.3%	1.7%
PCB-157	0.867	3.468	32.1	--		32.1	32.1	0.0005	0.0	0.0	0.3%	0.4%
PCB-167	0.799	3.196	60.5	--		60.5	60.5	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0625	0.25	1.14	--		1.14	1.14	0.01	0.0	0.0	0.2%	0.3%
PCB-189	1.1	4.4	19	--		19	19	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
3.5	3.2	1.5	0.8	5.1	4.0

APPENDIX A1. Field Results**FINAL**

Sample ID	991	Field		S36									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.102	0.408	0.601	NJ		0.3005		0.1	0.0		1.5%	0.0%	
2,3,7,8-TCDD	0.0458	0.1832		--		0.0229		1	0.0		1.2%	0.0%	
1,2,3,7,8-PeCDF	0.0266	0.1064	2.46	--		2.46	2.46	0.05	0.1	0.1	6.2%	7.3%	
2,3,4,7,8-PeCDF	0.586	2.344		E		0.293		0.5	0.1		7.4%	0.0%	
1,2,3,7,8-PeCDD	0.0262	0.1048		--		0.0131		1	0.0		0.7%	0.0%	
1,2,3,4,7,8-HxCDF	0.0313	0.1252	3.59	--		3.59	3.59	0.1	0.4	0.4	18.1%	21.2%	
1,2,3,6,7,8-HxCDF	0.0271	0.1084	1.91	--		1.91	1.91	0.1	0.2	0.2	9.6%	11.3%	
2,3,4,6,7,8-HxCDF	0.0314	0.1256	0.992	--		0.992	0.992	0.1	0.1	0.1	5.0%	5.9%	
1,2,3,7,8,9-HxCDF	0.0376	0.1504	1.1	B	<5x*B	1.1	0.55	0.1	0.1	0.1	5.6%	3.3%	
1,2,3,4,7,8-HxCDD	0.0315	0.126	0.385	--		0.385	0.385	0.1	0.0	0.0	1.9%	2.3%	
1,2,3,6,7,8-HxCDD	0.0265	0.106	0.713	--		0.713	0.713	0.1	0.1	0.1	3.6%	4.2%	
1,2,3,7,8,9-HxCDD	0.0297	0.1188	0.804	--		0.804	0.804	0.1	0.1	0.1	4.1%	4.8%	
1,2,3,4,6,7,8-HpCDF	0.042	0.168	11.3	--		11.3	11.3	0.01	0.1	0.1	5.7%	6.7%	
1,2,3,4,7,8,9-HpCDF	0.0564	0.2256	3.99	--		3.99	3.99	0.01	0.0	0.0	2.0%	2.4%	
1,2,3,4,6,7,8-HpCDD	0.0281	0.1124	7.69	--		7.69	7.69	0.01	0.1	0.1	3.9%	4.6%	
OCDF	0.0259	0.1036	78	--		78	78	0.0001	0.0	0.0	0.4%	0.5%	
OCDD	0.0281	0.1124	78.7	--		78.7	78.7	0.0001	0.0	0.0	0.4%	0.5%	
PCB-77	1.56	6.24	20.7	--		20.7	20.7	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	1.89	7.56	3.39	B	<5x*B	3.39	0.8475	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	1.44	5.76	91.9	B	<5x*B	91.9	45.95	0.0001	0.0	0.0	0.5%	0.3%	
PCB-114	3.52	14.08		E		1.76		0.0005	0.0		0.0%	0.0%	
PCB-118	1.36	5.44	188	B	<5x*B	188	94	0.0001	0.0	0.0	1.0%	0.6%	
PCB-123	1.52	6.08	7.71	J		7.71	3.855	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.171	0.684	3.95	--		3.95	3.95	0.1	0.4	0.4	19.9%	23.4%	
PCB-156	0.482	1.928	26.3	B	<5x*B	26.3	13.15	0.0005	0.0	0.0	0.7%	0.4%	
PCB-157	0.508	2.032	9.07	--		9.07	9.07	0.0005	0.0	0.0	0.2%	0.3%	
PCB-167	0.469	1.876	12.7	J		12.7	6.35	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0913	0.3652	0.489	--		0.489	0.489	0.01	0.0	0.0	0.3%	0.3%	
PCB-189	0.156	0.624	3.61	--		3.61	3.61	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.5	1.3	0.5	0.4	2.0	1.7

APPENDIX A1. Field Results**FINAL**

Sample ID	102	Field		S4									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0921	0.3684		E		0.04605		0.1	0.0		0.4%	0.0%	
2,3,7,8-TCDD	0.00249	0.01		--		0.001245		1	0.0		0.1%	0.0%	
1,2,3,7,8-PeCDF	0.00148	0.0059	0.18	--		0.18	0.18	0.05	0.0	0.0	0.8%	1.3%	
2,3,4,7,8-PeCDF	0.239	0.956		E		0.1195		0.5	0.1		5.6%	0.0%	
1,2,3,7,8-PeCDD	0.0191	0.0764	0.22	--		0.22	0.22	1	0.2	0.2	20.7%	30.9%	
1,2,3,4,7,8-HxCDF	0.241	0.964		E	<5x*B	0.1205		0.1	0.0		1.1%	0.0%	
1,2,3,6,7,8-HxCDF	0.168	0.672		E		0.084		0.1	0.0		0.8%	0.0%	
2,3,4,6,7,8-HxCDF	0.0314	0.1256	0.426	B	<5x*B	0.426	0.213	0.1	0.0	0.0	4.0%	3.0%	
1,2,3,7,8,9-HxCDF	0.0377	0.1508	0.268	B	<5x*B	0.268	0.134	0.1	0.0	0.0	2.5%	1.9%	
1,2,3,4,7,8-HxCDD	0.315	1.26		E		0.1575		0.1	0.0		1.5%	0.0%	
1,2,3,6,7,8-HxCDD	0.377	1.508		E		0.1885		0.1	0.0		1.8%	0.0%	
1,2,3,7,8,9-HxCDD	0.00169	0.0068	0.233	--		0.233	0.233	0.1	0.0	0.0	2.2%	3.3%	
1,2,3,4,6,7,8-HpCDF	0.0225	0.09	2.37	--		2.37	2.37	0.01	0.0	0.0	2.2%	3.3%	
1,2,3,4,7,8,9-HpCDF	0.0251	0.1004	0.32	--		0.32	0.32	0.01	0.0	0.0	0.3%	0.4%	
1,2,3,4,6,7,8-HpCDD	0.0392	0.1568	10	--		10	10	0.01	0.1	0.1	9.4%	14.0%	
OCDF	0.0209	0.0836	5.12	--		5.12	5.12	0.0001	0.0	0.0	0.0%	0.1%	
OCDD	0.0173	0.0692	80.4	--		80.4	80.4	0.0001	0.0	0.0	0.8%	1.1%	
PCB-77	0.187	0.748	12.8	B	<5x*B	12.8	6.4	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	0.198	0.792	0.927	B	<5x*B	0.927	0.4635	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.41	1.64	148	--		148	148	0.0001	0.0	0.0	1.4%	2.1%	
PCB-114	0.407	1.628	6.9	--		6.9	6.9	0.0005	0.0	0.0	0.3%	0.5%	
PCB-118	0.368	1.472	356	--		356	356	0.0001	0.0	0.0	3.4%	5.0%	
PCB-123	0.414	1.656	5.85	B	<5x*B	5.85	2.925	0.0001	0.0	0.0	0.1%	0.0%	
PCB-126	0.117	0.468	3.87	J		3.87	1.935	0.1	0.4	0.2	36.4%	27.2%	
PCB-156	0.131	0.524	59	--		59	59	0.0005	0.0	0.0	2.8%	4.1%	
PCB-157	0.138	0.552	12.9	--		12.9	12.9	0.0005	0.0	0.0	0.6%	0.9%	
PCB-167	0.127	0.508	21.7	--		21.7	21.7	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0417	0.1668	0.493	--		0.493	0.493	0.01	0.0	0.0	0.5%	0.7%	
PCB-189	0.059	0.236	3.88	--		3.88	3.88	0.0001	0.0	0.0	0.0%	0.1%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.6	0.4	0.5	0.3	1.1	0.7

APPENDIX A1. Field Results

FINAL

Sample ID	234	Field		S5								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0294	0.1176	0.386	NJ		0.193		0.1	0.0		0.9%	0.0%
2,3,7,8-TCDD	0.0205	0.082	0.934	--		0.934	0.934	1	0.9	0.9	45.9%	54.9%
1,2,3,7,8-PeCDF	0.14	0.56	0.683	--		0.683	0.683	0.05	0.0	0.0	1.7%	2.0%
2,3,4,7,8-PeCDF	0.117	0.468	0.414	--		0.414	0.207	0.5	0.2	0.1	10.2%	6.1%
1,2,3,7,8-PeCDD	0.275	1.1		E		0.1375		1	0.1		6.8%	0.0%
1,2,3,4,7,8-HxCDF	0.0727	0.2908	1	--		1	1	0.1	0.1	0.1	4.9%	5.9%
1,2,3,6,7,8-HxCDF	0.0624	0.2496	0.686	B	<5x*B	0.686	0.343	0.1	0.1	0.0	3.4%	2.0%
2,3,4,6,7,8-HxCDF	0.0763	0.3052	0.426	--		0.426	0.426	0.1	0.0	0.0	2.1%	2.5%
1,2,3,7,8,9-HxCDF	0.0894	0.3576	0.508	--		0.508	0.508	0.1	0.1	0.1	2.5%	3.0%
1,2,3,4,7,8-HxCDD	0.205	0.82		E		0.1025		0.1	0.0		0.5%	0.0%
1,2,3,6,7,8-HxCDD	0.0103	0.0412	0.401	--		0.401	0.401	0.1	0.0	0.0	2.0%	2.4%
1,2,3,7,8,9-HxCDD	0.0122	0.0488	0.341	J		0.341	0.1705	0.1	0.0	0.0	1.7%	1.0%
1,2,3,4,6,7,8-HpCDF	0.0256	0.1024	3.62	--		3.62	3.62	0.01	0.0	0.0	1.8%	2.1%
1,2,3,4,7,8,9-HpCDF	0.0382	0.1528	1.12	--		1.12	1.12	0.01	0.0	0.0	0.6%	0.7%
1,2,3,4,6,7,8-HpCDD	0.0243	0.0972	8.44	--		8.44	8.44	0.01	0.1	0.1	4.1%	5.0%
OCDF	0.0257	0.1028	18	--		18	18	0.0001	0.0	0.0	0.1%	0.1%
OCDD	0.0261	0.1044	71.9	--		71.9	71.9	0.0001	0.0	0.0	0.4%	0.4%
PCB-77	0.0698	0.2792	6.18	B	<5x*B	6.18	3.09	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.0983	0.3932	0.661	B	<5x*B	0.661	0.3305	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.665	2.66	33	B	<5x*B	33	16.5	0.0001	0.0	0.0	0.2%	0.1%
PCB-114	0.695	2.78	1.41	B	<5x*B	1.41	0.3525	0.0005	0.0	0.0	0.0%	0.0%
PCB-118	0.713	2.852	72.6	B	<5x*B	72.6	36.3	0.0001	0.0	0.0	0.4%	0.2%
PCB-123	0.811	3.244	2.76	B	<5x*B	2.76	0.69	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.135	0.54	1.89	--		1.89	1.89	0.1	0.2	0.2	9.3%	11.1%
PCB-156	0.196	0.784	15.7	B	<5x*B	15.7	7.85	0.0005	0.0	0.0	0.4%	0.2%
PCB-157	0.202	0.808	4.58	B	<5x*B	4.58	2.29	0.0005	0.0	0.0	0.1%	0.1%
PCB-167	0.199	0.796	8.29	--		8.29	8.29	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0662	0.2648	0.422	--		0.422	0.422	0.01	0.0	0.0	0.2%	0.2%
PCB-189	0.189	0.756	2.46	--		2.46	2.46	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.8	1.5	0.2	0.2	2.0	1.7

Sample ID	830	Field		S6								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0358	0.1432	0.366	NJ		0.183		0.1	0.0		1.0%	0.0%
2,3,7,8-TCDD	0.0253	0.1012		--		0.01265		1	0.0		0.7%	0.0%
1,2,3,7,8-PeCDF	0.0326	0.1304	1.87	--		1.87	1.87	0.05	0.1	0.1	5.0%	6.3%
2,3,4,7,8-PeCDF	0.0225	0.09	0.403	--		0.403	0.403	0.5	0.2	0.2	10.8%	13.5%
1,2,3,7,8-PeCDD	0.361	1.444		E		0.1805		1	0.2		9.7%	0.0%
1,2,3,4,7,8-HxCDF	0.0522	0.2088	3.19	--		3.19	3.19	0.1	0.3	0.3	17.1%	21.4%
1,2,3,6,7,8-HxCDF	0.0446	0.1784	1.98	B	<5x*B	1.98	0.99	0.1	0.2	0.1	10.6%	6.6%
2,3,4,6,7,8-HxCDF	0.0507	0.2028	0.864	--		0.864	0.864	0.1	0.1	0.1	4.6%	5.8%
1,2,3,7,8,9-HxCDF	0.0618	0.2472	1.14	--		1.14	1.14	0.1	0.1	0.1	6.1%	7.6%
1,2,3,4,7,8-HxCDD	0.00298	0.0119	0.262	--		0.262	0.262	0.1	0.0	0.0	1.4%	1.8%
1,2,3,6,7,8-HxCDD	0.00218	0.0087	0.742	--		0.742	0.742	0.1	0.1	0.1	4.0%	5.0%
1,2,3,7,8,9-HxCDD	0.0026	0.0104	1	J		1	0.5	0.1	0.1	0.1	5.4%	3.4%
1,2,3,4,6,7,8-HpCDF	0.0396	0.1584	9.32	--		9.32	9.32	0.01	0.1	0.1	5.0%	6.2%
1,2,3,4,7,8,9-HpCDF	0.0432	0.1728	3.85	--		3.85	3.85	0.01	0.0	0.0	2.1%	2.6%
1,2,3,4,6,7,8-HpCDD	0.0227	0.0908	6.4	--		6.4	6.4	0.01	0.1	0.1	3.4%	4.3%
OCDF	0.031	0.124	56.1	--		56.1	56.1	0.0001	0.0	0.0	0.3%	0.4%
OCDD	0.0293	0.1172	47.2	--		47.2	47.2	0.0001	0.0	0.0	0.3%	0.3%
PCB-77	0.0723	0.2892	12.2	B	<5x*B	12.2	6.1	0.0001	0.0	0.0	0.1%	0.0%
PCB-81	0.0905	0.362	0.869	B	<5x*B	0.869	0.4345	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.184	0.736	47.2	B	<5x*B	47.2	23.6	0.0001	0.0	0.0	0.3%	0.2%
PCB-114	0.193	0.772	2.03	B	<5x*B	2.03	1.015	0.0005	0.0	0.0	0.1%	0.0%
PCB-118	0.201	0.804	72.3	B	<5x*B	72.3	36.15	0.0001	0.0	0.0	0.4%	0.2%
PCB-123	0.228	0.912		--	<5x*B	0.114		0.0001	0.0		0.0%	0.0%
PCB-126	0.158	0.632	2.11	--		2.11	2.11	0.1	0.2	0.2	11.3%	14.1%
PCB-156	0.189	0.756	13.8	B	<5x*B	13.8	6.9	0.0005	0.0	0.0	0.4%	0.2%
PCB-157	0.196	0.784	4.3	B	<5x*B	4.3	2.15	0.0005	0.0	0.0	0.1%	0.1%
PCB-167	0.192	0.768	7.34	B	<5x*B	7.34	3.67	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.403	1.612		E		0.2015		0.01	0.0		0.1%	0.0%
PCB-189	0.189	0.756	2.46	--		2.46	2.46	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.6	1.3	0.2	0.2	1.9	1.5

APPENDIX A1. Field Results

FINAL

Sample ID	788	Field		S7								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.223	0.892		E		0.1115		0.1	0.0		0.8%	0.0%
2,3,7,8-TCDD	0.0115	0.046		--		0.00575		1	0.0		0.4%	0.0%
1,2,3,7,8-PeCDF	0.0375	0.15	0.553	--		0.553	0.553	0.05	0.0	0.0	2.0%	2.1%
2,3,4,7,8-PeCDF	0.029	0.116	0.298	--		0.298	0.298	0.5	0.1	0.1	10.8%	11.3%
1,2,3,7,8-PeCDD	0.0202	0.0808	0.308	--		0.308	0.308	1	0.3	0.3	22.3%	23.4%
1,2,3,4,7,8-HxCDF	0.0191	0.0764	0.687	--		0.687	0.687	0.1	0.1	0.1	5.0%	5.2%
1,2,3,6,7,8-HxCDF	0.0172	0.0688	0.473	B	<5x*B	0.473	0.2365	0.1	0.0	0.0	3.4%	1.8%
2,3,4,6,7,8-HxCDF	0.0184	0.0736	0.429	--		0.429	0.429	0.1	0.0	0.0	3.1%	3.3%
1,2,3,7,8,9-HxCDF	0.0188	0.0752	0.481	--		0.481	0.481	0.1	0.0	0.0	3.5%	3.7%
1,2,3,4,7,8-HxCDD	0.0195	0.078	0.267	--		0.267	0.267	0.1	0.0	0.0	1.9%	2.0%
1,2,3,6,7,8-HxCDD	0.0147	0.0588	0.473	--		0.473	0.473	0.1	0.0	0.0	3.4%	3.6%
1,2,3,7,8,9-HxCDD	0.395	1.58		EJ		0.1975		0.1	0.0		1.4%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0233	0.0932	3.6	--		3.6	3.6	0.01	0.0	0.0	2.6%	2.7%
1,2,3,4,7,8,9-HpCDF	0.0312	0.1248	0.929	--		0.929	0.929	0.01	0.0	0.0	0.7%	0.7%
1,2,3,4,6,7,8-HpCDD	0.0225	0.09	11.3	--		11.3	11.3	0.01	0.1	0.1	8.2%	8.6%
OCDF	0.0116	0.0464	33.8	--		33.8	33.8	0.0001	0.0	0.0	0.2%	0.3%
OCDD	0.0181	0.0724	96.2	--		96.2	96.2	0.0001	0.0	0.0	0.7%	0.7%
PCB-77	0.0334	0.1336	9.92	B	<5x*B	9.92	4.96	0.0001	0.0	0.0	0.1%	0.0%
PCB-81	0.0425	0.17	0.802	B	<5x*B	0.802	0.401	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.231	0.924	59.4	--		59.4	59.4	0.0001	0.0	0.0	0.4%	0.5%
PCB-114	0.242	0.968	3.2	B	<5x*B	3.2	1.6	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.313	1.252	139	--		139	139	0.0001	0.0	0.0	1.0%	1.1%
PCB-123	0.355	1.42	4.5	J		4.5	2.25	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.0536	0.2144	3.69	--		3.69	3.69	0.1	0.4	0.4	26.7%	28.0%
PCB-156	0.0923	0.3692	23.5	--		23.5	23.5	0.0005	0.0	0.0	0.9%	0.9%
PCB-157	0.0954	0.3816	6.24	--		6.24	6.24	0.0005	0.0	0.0	0.2%	0.2%
PCB-167	0.0939	0.3756	12.7	--		12.7	12.7	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.422	1.688		E		0.211		0.01	0.0		0.2%	0.0%
PCB-189	0.132	0.528	3.01	--		3.01	3.01	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.0	0.9	0.4	0.4	1.4	1.3

APPENDIX A1. Field Results

FINAL

Sample ID	589	Field		S8								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0543	0.2172	--		0.02715		0.1	0.0			0.8%	0.0%
2,3,7,8-TCDD	0.0284	0.1136	--		0.0142		1	0.0			3.9%	0.0%
1,2,3,7,8-PeCDF	0.0981	0.3924	--		0.04905		0.05	0.0			0.7%	0.0%
2,3,4,7,8-PeCDF	0.0692	0.2768	--		0.0346		0.5	0.0			4.8%	0.0%
1,2,3,7,8-PeCDD	0.0593	0.2372	--		0.02965		1	0.0			8.2%	0.0%
1,2,3,4,7,8-HxCDF	0.023	0.092	0.266	--	0.266	0.266	0.1	0.0	0.0		7.3%	10.8%
1,2,3,6,7,8-HxCDF	0.0204	0.0816	0.206	B	<5x*B	0.206	0.103	0.1	0.0	0.0	5.7%	4.2%
2,3,4,6,7,8-HxCDF	0.0242	0.0968	--		0.0121		0.1	0.0			0.3%	0.0%
1,2,3,7,8,9-HxCDF	0.0296	0.1184	0.391	--	0.391	0.391	0.1	0.0	0.0		10.8%	15.8%
1,2,3,4,7,8-HxCDD	0.205	0.82	E		0.1025		0.1	0.0			2.8%	0.0%
1,2,3,6,7,8-HxCDD	0.0441	0.1764	0.279	--	0.279	0.279	0.1	0.0	0.0		7.7%	11.3%
1,2,3,7,8,9-HxCDD	0.237	0.948	EJ		0.1185		0.1	0.0			3.3%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0208	0.0832	1.29	B	<5x*B	1.29	0.645	0.01	0.0	0.0	3.6%	2.6%
1,2,3,4,7,8,9-HpCDF	0.362	1.448	E		0.181		0.01	0.0			0.5%	0.0%
1,2,3,4,6,7,8-HpCDD	0.0141	0.0564	4.28	--	4.28	4.28	0.01	0.0	0.0		11.8%	17.3%
OCDF	0.0607	0.2428	4.85	--	4.85	4.85	0.0001	0.0	0.0		0.1%	0.2%
OCDD	0.046	0.184	36.1	--	36.1	36.1	0.0001	0.0	0.0		1.0%	1.5%
PCB-77	0.0602	0.2408	2.94	B	<5x*B	2.94	1.47	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.0904	0.3616	0.718	B	<5x*B	0.718	0.359	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.504	2.016	19.9	B	<5x*B	19.9	9.95	0.0001	0.0	0.0	0.6%	0.4%
PCB-114	0.527	2.108	1.48	B	<5x*B	1.48	0.37	0.0005	0.0	0.0	0.2%	0.1%
PCB-118	0.57	2.28	48.5	B	<5x*B	48.5	24.25	0.0001	0.0	0.0	1.3%	1.0%
PCB-123	1.24	4.96	E	<5x*B	0.62		0.0001	0.0			0.0%	0.0%
PCB-126	0.184	0.736	0.845	--	0.845	0.845	0.1	0.1	0.1		23.3%	34.2%
PCB-156	0.205	0.82	7.12	B	<5x*B	7.12	3.56	0.0005	0.0	0.0	1.0%	0.7%
PCB-157	1.96	7.84	E	<5x*B	0.98		0.0005	0.0			0.1%	0.0%
PCB-167	0.209	0.836	3.8	B	<5x*B	3.8	1.9	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.109	0.436	--		0.0545		0.01	0.0			0.2%	0.0%
PCB-189	0.143	0.572	1.05	--	1.05	1.05	0.0001	0.0	0.0		0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.3	0.2	0.1	0.1	0.4	0.2

Sample ID	249	Field		S9									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.319	1.276		E	0.1595		0.1	0.0			0.6%	0.0%	
2,3,7,8-TCDD	0.0024	0.0096		--	0.0012		1	0.0			0.0%	0.0%	
1,2,3,7,8-PeCDF	0.437	1.748		E	0.2185		0.05	0.0			0.4%	0.0%	
2,3,4,7,8-PeCDF	0.539	2.156		E	0.2695		0.5	0.1			4.8%	0.0%	
1,2,3,7,8-PeCDD	0.00221	0.0088	0.486	--	0.486	0.486	1	0.5	0.5	0.5	17.3%	24.2%	
1,2,3,4,7,8-HxCDF	0.0541	0.2164	0.654	--	0.654	0.654	0.1	0.1	0.1	0.1	2.3%	3.3%	
1,2,3,6,7,8-HxCDF	0.0483	0.1932	0.469	--	0.469	0.469	0.1	0.0	0.0	0.0	1.7%	2.3%	
2,3,4,6,7,8-HxCDF	0.0547	0.2188	0.752	--	0.752	0.752	0.1	0.1	0.1	0.1	2.7%	3.7%	
1,2,3,7,8,9-HxCDF	0.0601	0.2404	0.387	B	<5x*B	0.387	0.1935	0.1	0.0	0.0	0.0	1.4%	1.0%
1,2,3,4,7,8-HxCDD	0.692	2.768		E	0.346		0.1	0.0			1.2%	0.0%	
1,2,3,6,7,8-HxCDD	0.00169	0.0068	1.31	--	1.31	1.31	0.1	0.1	0.1	0.1	4.7%	6.5%	
1,2,3,7,8,9-HxCDD	0.00164	0.0066	0.819	--	0.819	0.819	0.1	0.1	0.1	0.1	2.9%	4.1%	
1,2,3,4,6,7,8-HpCDF	0.0571	0.2284	6.42	--	6.42	6.42	0.01	0.1	0.1	0.1	2.3%	3.2%	
1,2,3,4,7,8,9-HpCDF	0.0825	0.33	0.657	--	0.657	0.657	0.01	0.0	0.0	0.0	0.2%	0.3%	
1,2,3,4,6,7,8-HpCDD	0.0191	0.0764	34.6	--	34.6	34.6	0.01	0.3	0.3	0.3	12.3%	17.2%	
OCDF	0.00597	0.0239	19.1	--	19.1	19.1	0.0001	0.0	0.0	0.0	0.1%	0.1%	
OCDD	0.0226	0.0904	311	--	311	311	0.0001	0.0	0.0	0.0	1.1%	1.5%	
PCB-77	0.0261	0.1044	37.6	--	37.6	37.6	0.0001	0.0	0.0	0.0	0.1%	0.2%	
PCB-81	0.03	0.12	1.51	B	<5x*B	1.51	0.755	0.0001	0.0	0.0	0.0	0.0%	0.0%
PCB-105	1.22	4.88	133	--	133	133	0.0001	0.0	0.0	0.0	0.5%	0.7%	
PCB-114	1.22	4.88	4.94	--	4.94	4.94	0.0005	0.0	0.0	0.0	0.1%	0.1%	
PCB-118	1.08	4.32	254	B	<5x*B	254	127	0.0001	0.0	0.0	0.0	0.9%	0.6%
PCB-123	1.21	4.84	7.75	--	7.75	7.75	0.0001	0.0	0.0	0.0	0.0%	0.0%	
PCB-126	0.0554	0.2216	11.4	J	11.4	5.7	0.1	1.1	0.6	0.6	40.5%	28.3%	
PCB-156	0.203	0.812	61.5	--	61.5	61.5	0.0005	0.0	0.0	0.0	1.1%	1.5%	
PCB-157	0.214	0.856	14.5	--	14.5	14.5	0.0005	0.0	0.0	0.0	0.3%	0.4%	
PCB-167	0.197	0.788	26.6	--	26.6	26.6	0.00001	0.0	0.0	0.0	0.0%	0.0%	
PCB-169	0.0221	0.0884	1.45	--	1.45	1.45	0.01	0.0	0.0	0.0	0.5%	0.7%	
PCB-189	0.114	0.456	8.19	--	8.19	8.19	0.0001	0.0	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.6	1.4	1.2	0.7	2.8	2.0

APPENDIX A2. Quality Control Results

FINAL

Sample ID	429-B	Bulk		S2								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.705	2.82	1.13	NJ		0.565		0.1	0.1		0.8%	0.0%
2,3,7,8-TCDD	0.0689	0.2756	1.9	--		1.9	1.9	1	1.9	1.9	27.9%	32.4%
1,2,3,7,8-PeCDF	0.0339	0.1356	4.19	--		4.19	4.19	0.05	0.2	0.2	3.1%	3.6%
2,3,4,7,8-PeCDF	0.0279	0.1116	1.4	--		1.4	1.4	0.5	0.7	0.7	10.3%	12.0%
1,2,3,7,8-PeCDD	0.658	2.632		E		0.329		1	0.3		4.8%	0.0%
1,2,3,4,7,8-HxCDF	0.0701	0.2804	6.81	--		6.81	6.81	0.1	0.7	0.7	10.0%	11.6%
1,2,3,6,7,8-HxCDF	0.0558	0.2232	3.59	--		3.59	3.59	0.1	0.4	0.4	5.3%	6.1%
2,3,4,6,7,8-HxCDF	0.0691	0.2764	1.99	--		1.99	1.99	0.1	0.2	0.2	2.9%	3.4%
1,2,3,7,8,9-HxCDF	0.0662	0.2648	1.55	B	<5x*B	1.55	0.775	0.1	0.2	0.1	2.3%	1.3%
1,2,3,4,7,8-HxCDD	0.0648	0.2592	0.862	B	<5x*B	0.862	0.431	0.1	0.1	0.0	1.3%	0.7%
1,2,3,6,7,8-HxCDD	0.0587	0.2348	2.02	--		2.02	2.02	0.1	0.2	0.2	3.0%	3.4%
1,2,3,7,8,9-HxCDD	0.0638	0.2552	1.3	--		1.3	1.3	0.1	0.1	0.1	1.9%	2.2%
1,2,3,4,6,7,8-HpCDF	0.225	0.9	22.4	--		22.4	22.4	0.01	0.2	0.2	3.3%	3.8%
1,2,3,4,7,8,9-HpCDF	0.31	1.24	6.45	--		6.45	6.45	0.01	0.1	0.1	0.9%	1.1%
1,2,3,4,6,7,8-HpCDD	0.0786	0.3144	42.1	--		42.1	42.1	0.01	0.4	0.4	6.2%	7.2%
OCDF	0.0543	0.2172	90.2	--		90.2	90.2	0.0001	0.0	0.0	0.1%	0.2%
OCDD	0.0423	0.1692	303	--		303	303	0.0001	0.0	0.0	0.4%	0.5%
PCB-77	0.152	0.608	38.1	--		38.1	38.1	0.0001	0.0	0.0	0.1%	0.1%
PCB-81	0.139	0.556	1.88	B	<5x*B	1.88	0.94	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	1.1	4.4	479	--		479	479	0.0001	0.0	0.0	0.7%	0.8%
PCB-114	1.09	4.36	26.2	--		26.2	26.2	0.0005	0.0	0.0	0.2%	0.2%
PCB-118	1.01	4.04	1120	CJ		1120	560	0.0001	0.1	0.1	1.6%	1.0%
PCB-123	1.13	4.52		--		0.565		0.0001	0.0		0.0%	0.0%
PCB-126	2.33	9.32	7.64	--		7.64	3.82	0.1	0.8	0.4	11.2%	6.5%
PCB-156	0.735	2.94	148	--		148	148	0.0005	0.1	0.1	1.1%	1.3%
PCB-157	0.774	3.096	36.4	--		36.4	36.4	0.0005	0.0	0.0	0.3%	0.3%
PCB-167	0.714	2.856	64.7	--		64.7	64.7	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.087	0.348	0.927	--		0.927	0.927	0.01	0.0	0.0	0.1%	0.2%
PCB-189	0.87	3.48	13.3	--		13.3	13.3	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
5.8	5.2	1.0	0.6	6.8	5.9

APPENDIX A2. Quality Control Results

FINAL

Sample ID	338	Duplicate	S23										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.057	0.228		--		0.0285		0.1	0.0		0.5%	0.0%	
2,3,7,8-TCDD	0.0328	0.1312		--		0.0164		1	0.0		3.0%	0.0%	
1,2,3,7,8-PeCDF	0.0178	0.0712	0.158	--		0.158	0.158	0.05	0.0	0.0	1.5%	2.0%	
2,3,4,7,8-PeCDF	0.118	0.472		E		0.059		0.5	0.0		5.4%	0.0%	
1,2,3,7,8-PeCDD	0.0149	0.0596		--		0.00745		1	0.0		1.4%	0.0%	
1,2,3,4,7,8-HxCDF	0.0247	0.0988	0.144	B	<5x*B	0.144	0.072	0.1	0.0	0.0	2.7%	1.8%	
1,2,3,6,7,8-HxCDF	0.0217	0.0868	0.279	--		0.279	0.279	0.1	0.0	0.0	5.1%	7.1%	
2,3,4,6,7,8-HxCDF	0.154	0.616		E	<5x*B	0.077		0.1	0.0		1.4%	0.0%	
1,2,3,7,8,9-HxCDF	0.0272	0.1088	0.372	B	<5x*B	0.372	0.186	0.1	0.0	0.0	6.8%	4.7%	
1,2,3,4,7,8-HxCDD	0.194	0.776		E		0.097		0.1	0.0		1.8%	0.0%	
1,2,3,6,7,8-HxCDD	0.00641	0.0256	0.874	--		0.874	0.874	0.1	0.1	0.1	16.1%	22.3%	
1,2,3,7,8,9-HxCDD	0.00716	0.0286	1.61	--		1.61	1.61	0.1	0.2	0.2	29.6%	41.0%	
1,2,3,4,6,7,8-HpCDF	0.0368	0.1472	0.79	--		0.79	0.79	0.01	0.0	0.0	1.5%	2.0%	
1,2,3,4,7,8,9-HpCDF	0.0499	0.1996	0.144	--		0.144	0.072	0.01	0.0	0.0	0.3%	0.2%	
1,2,3,4,6,7,8-HpCDD	0.0217	0.0868	2.28	--		2.28	2.28	0.01	0.0	0.0	4.2%	5.8%	
OCDF	0.0171	0.0684	2.11	B	<5x*B	2.11	1.055	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0118	0.0472	15	--		15	15	0.0001	0.0	0.0	0.3%	0.4%	
PCB-77	1.08	4.32	4.35	B	<5x*B	4.35	2.175	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	1.22	4.88		--	<5x*B	0.61		0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.323	1.292	20.3	B	<5x*B	20.3	10.15	0.0001	0.0	0.0	0.4%	0.3%	
PCB-114	0.901	3.604		E		0.4505		0.0005	0.0		0.0%	0.0%	
PCB-118	0.318	1.272	45.5	B	<5x*B	45.5	22.75	0.0001	0.0	0.0	0.8%	0.6%	
PCB-123	0.357	1.428	1.69	BJ	<5x*B	1.69	0.845	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.0939	0.3756	0.876	B	<5x*B	0.876	0.438	0.1	0.1	0.0	16.1%	11.2%	
PCB-156	0.23	0.92	5.09	B	<5x*B	5.09	2.545	0.0005	0.0	0.0	0.5%	0.3%	
PCB-157	1.72	6.88		E	<5x*B	0.86		0.0005	0.0		0.1%	0.0%	
PCB-167	0.224	0.896	2.36	BJ	<5x*B	2.36	1.18	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0649	0.2596	0.187	--		0.187	0.0935	0.01	0.0	0.0	0.3%	0.2%	
PCB-189	0.148	0.592	0.583	--		0.583	0.2915	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.4	0.3	0.1	0.0	0.5	0.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAWMB	<i>Lab Blank</i>											
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.00879	0.0352	--		0.004395		0.1	0.0			0.4%	0.0%	
2,3,7,8-TCDD	0.00244	0.0098	--		0.00122		1	0.0			1.1%	0.0%	
1,2,3,7,8-PeCDF	0.00133	0.0053	--		0.000665		0.05	0.0			0.0%	0.0%	
2,3,4,7,8-PeCDF	0.00102	0.0041	--		0.00051		0.5	0.0			0.2%	0.0%	
1,2,3,7,8-PeCDD	0.00137	0.0055	--		0.000685		1	0.0			0.6%	0.0%	
1,2,3,4,7,8-HxCDF	0.00094	0.0038	--		0.0004705		0.1	0.0			0.0%	0.0%	
1,2,3,6,7,8-HxCDF	0.181	0.724	E		0.0905		0.1	0.0			8.2%	0.0%	
2,3,4,6,7,8-HxCDF	0.00098	0.0039	--		0.00049		0.1	0.0			0.0%	0.0%	
1,2,3,7,8,9-HxCDF	0.00117	0.0047	0.568	--	<5x*B	0.568	0.568	0.1	0.1	0.1	51.3%	60.1%	
1,2,3,4,7,8-HxCDD	0.00159	0.0064	0.228	--	<5x*B	0.228	0.228	0.1	0.0	0.0	20.6%	24.1%	
1,2,3,6,7,8-HxCDD	0.00165	0.0066	--		0.000825		0.1	0.0			0.1%	0.0%	
1,2,3,7,8,9-HxCDD	0.00169	0.0068	--		0.000845		0.1	0.0			0.1%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.00107	0.0043	0.194	--	<5x*B	0.194	0.194	0.01	0.0	0.0	1.8%	2.1%	
1,2,3,4,7,8,9-HpCDF	0.00166	0.0066	--		0.00083		0.01	0.0			0.0%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.00145	0.0058	0.468	--	<5x*B	0.468	0.468	0.01	0.0	0.0	4.2%	5.0%	
OCDF	0.00051	0.0020	--		0.0002555		0.0001	0.0			0.0%	0.0%	
OCDD	0.00148	0.0059	2.23	--	<5x*B	2.23	2.23	0.0001	0.0	0.0	0.2%	0.2%	
PCB-77	0.0602	0.2408	3.61	--	<5x*B	3.61	3.61	0.0001	0.0	0.0	0.3%	0.4%	
PCB-81	0.0603	0.2412	0.689	--	<5x*B	0.689	0.689	0.0001	0.0	0.0	0.1%	0.1%	
PCB-105	0.581	2.324	15.1	--	<5x*B	15.1	15.1	0.0001	0.0	0.0	1.4%	1.6%	
PCB-114	0.578	2.312	1.08	--	<5x*B	1.08	0.54	0.0005	0.0	0.0	0.5%	0.3%	
PCB-118	0.5	2	36.9	--	<5x*B	36.9	36.9	0.0001	0.0	0.0	3.3%	3.9%	
PCB-123	2.15	8.6	E		1.075		0.0001	0.0			0.1%	0.0%	
PCB-126	0.0723	0.2892	--		0.03615		0.1	0.0			3.3%	0.0%	
PCB-156	0.194	0.776	3.38	--	<5x*B	3.38	3.38	0.0005	0.0	0.0	1.5%	1.8%	
PCB-157	0.204	0.816	0.884	--	<5x*B	0.884	0.884	0.0005	0.0	0.0	0.4%	0.5%	
PCB-167	0.188	0.752	1.13	--	<5x*B	1.13	1.13	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0358	0.1432	--		0.0179		0.01	0.0			0.2%	0.0%	
PCB-189	0.345	1.38	E		0.1725		0.0001	0.0			0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.1	0.1	0.0	0.0	0.1	0.1

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAXMB	<i>Lab Blank</i>											
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0496	0.1984		--		0.0248		0.1	0.0		1.1%	0.0%	
2,3,7,8-TCDD	0.065	0.26		--		0.0325		1	0.0		14.4%	0.0%	
1,2,3,7,8-PeCDF	0.0452	0.1808		--		0.0226		0.05	0.0		0.5%	0.0%	
2,3,4,7,8-PeCDF	0.0374	0.1496		--		0.0187		0.5	0.0		4.1%	0.0%	
1,2,3,7,8-PeCDD	0.0946	0.3784		--		0.0473		1	0.0		20.9%	0.0%	
1,2,3,4,7,8-HxCDF	0.0258	0.1032	0.0848	--	<5x*B	0.0848	0.0424	0.1	0.0	0.0	3.7%	4.5%	
1,2,3,6,7,8-HxCDF	0.165	0.66		E		0.0825		0.1	0.0		3.6%	0.0%	
2,3,4,6,7,8-HxCDF	0.0257	0.1028	0.122	--	<5x*B	0.122	0.122	0.1	0.0	0.0	5.4%	13.0%	
1,2,3,7,8,9-HxCDF	0.0301	0.1204	0.529	--	<5x*B	0.529	0.529	0.1	0.1	0.1	23.4%	56.2%	
1,2,3,4,7,8-HxCDD	0.0328	0.1312		--		0.0164		0.1	0.0		0.7%	0.0%	
1,2,3,6,7,8-HxCDD	0.0267	0.1068		--		0.01335		0.1	0.0		0.6%	0.0%	
1,2,3,7,8,9-HxCDD	0.0303	0.1212		--		0.01515		0.1	0.0		0.7%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.187	0.748		E		0.0935		0.01	0.0		0.4%	0.0%	
1,2,3,4,7,8,9-HpCDF	0.0969	0.3876		E		0.04845		0.01	0.0		0.2%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.472	1.888		E		0.236		0.01	0.0		1.0%	0.0%	
OCDF	0.0492	0.1968	0.542	--	<5x*B	0.542	0.542	0.0001	0.0	0.0	0.0%	0.1%	
OCDD	2.16	8.64		E		1.08		0.0001	0.0		0.1%	0.0%	
PCB-77	0.0986	0.3944	3.88	--	<5x*B	3.88	3.88	0.0001	0.0	0.0	0.2%	0.4%	
PCB-81	0.104	0.416	0.774	--	<5x*B	0.774	0.774	0.0001	0.0	0.0	0.0%	0.1%	
PCB-105	0.602	2.408	26.4	--	<5x*B	26.4	26.4	0.0001	0.0	0.0	1.2%	2.8%	
PCB-114	0.982	3.928		E		0.491		0.0005	0.0		0.1%	0.0%	
PCB-118	0.541	2.164	61.9	J	<5x*B	61.9	30.95	0.0001	0.0	0.0	2.7%	3.3%	
PCB-123	0.608	2.432	1.38	--	<5x*B	1.38	0.69	0.0001	0.0	0.0	0.1%	0.1%	
PCB-126	0.147	0.588	0.288	--	<5x*B	0.288	0.144	0.1	0.0	0.0	12.7%	15.3%	
PCB-156	0.287	1.148	6.46	--	<5x*B	6.46	6.46	0.0005	0.0	0.0	1.4%	3.4%	
PCB-157	0.303	1.212	1.8	--	<5x*B	1.8	1.8	0.0005	0.0	0.0	0.4%	1.0%	
PCB-167	0.279	1.116	1.83	J	<5x*B	1.83	0.915	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.163	0.652		E		0.0815		0.01	0.0		0.4%	0.0%	
PCB-189	0.512	2.048		E		0.256		0.0001	0.0		0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.2	0.1	0.0	0.0	0.2	0.1

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAYMB	<i>Lab Blank</i>										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0534	0.2136	--		0.0267		0.1	0.0			1.6%	0.0%
2,3,7,8-TCDD	0.0185	0.074	--		0.00925		1	0.0			5.6%	0.0%
1,2,3,7,8-PeCDF	0.0857	0.3428	--		0.04285		0.05	0.0			1.3%	0.0%
2,3,4,7,8-PeCDF	0.067	0.268	--		0.0335		0.5	0.0			10.1%	0.0%
1,2,3,7,8-PeCDD	0.116	0.464	--		0.058		1	0.1			35.1%	0.0%
1,2,3,4,7,8-HxCDF	0.0371	0.1484	--		0.01855		0.1	0.0			1.1%	0.0%
1,2,3,6,7,8-HxCDF	0.0315	0.126	0.422	--	<5x*B	0.422	0.422	0.1	0.0	0.0	25.6%	81.6%
2,3,4,6,7,8-HxCDF	0.0547	0.2188	--		0.02735		0.1	0.0			1.7%	0.0%
1,2,3,7,8,9-HxCDF	0.0811	0.3244	--		0.04055		0.1	0.0			2.5%	0.0%
1,2,3,4,7,8-HxCDD	0.0179	0.0716	--		0.00895		0.1	0.0			0.5%	0.0%
1,2,3,6,7,8-HxCDD	0.0142	0.0568	--		0.0071		0.1	0.0			0.4%	0.0%
1,2,3,7,8,9-HxCDD	0.0164	0.0656	J		0.0082		0.1	0.0			0.5%	0.0%
1,2,3,4,6,7,8-HpCDF	0.0559	0.2236	0.455	--	<5x*B	0.455	0.455	0.01	0.0	0.0	2.8%	8.8%
1,2,3,4,7,8,9-HpCDF	0.133	0.532	--		0.0665		0.01	0.0			0.4%	0.0%
1,2,3,4,6,7,8-HpCDD	0.685	2.74	E		0.3425		0.01	0.0			2.1%	0.0%
OCDF	1.56	6.24	E		0.78		0.0001	0.0			0.1%	0.0%
OCDD	4.07	16.28	E		2.035		0.0001	0.0			0.1%	0.0%
PCB-77	0.0853	0.3412	2.71	--	<5x*B	2.71	2.71	0.0001	0.0	0.0	0.2%	0.5%
PCB-81	0.108	0.432	0.896	--	<5x*B	0.896	0.896	0.0001	0.0	0.0	0.1%	0.2%
PCB-105	0.417	1.668	11.5	--	<5x*B	11.5	11.5	0.0001	0.0	0.0	0.7%	2.2%
PCB-114	0.436	1.744	1.08	--	<5x*B	1.08	0.54	0.0005	0.0	0.0	0.3%	0.5%
PCB-118	0.44	1.76	25.9	J	<5x*B	25.9	12.95	0.0001	0.0	0.0	1.6%	2.5%
PCB-123	0.5	2	0.776	--	<5x*B	0.776	0.388	0.0001	0.0	0.0	0.1%	0.1%
PCB-126	0.133	0.532	--		0.0665		0.1	0.0			4.0%	0.0%
PCB-156	0.417	1.668	3.17	--	<5x*B	3.17	3.17	0.0005	0.0	0.0	1.0%	3.1%
PCB-157	0.431	1.724	1.11	--	<5x*B	1.11	0.555	0.0005	0.0	0.0	0.3%	0.5%
PCB-167	0.424	1.696	1.59	--	<5x*B	1.59	0.795	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.124	0.496	--		0.062		0.01	0.0			0.4%	0.0%
PCB-189	0.207	0.828	--		0.1035		0.0001	0.0			0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.2	0.0	0.0	0.0	0.2	0.1

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GBAEMB	<i>Lab Blank</i>										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0369	0.1476		--	0.01845		0.1	0.0		0.3%	0.0%	
2,3,7,8-TCDD	0.00908	0.0363		--	0.00454		1	0.0		0.8%	0.0%	
1,2,3,7,8-PeCDF	0.404	1.616		E	0.202		0.05	0.0		1.7%	0.0%	
2,3,4,7,8-PeCDF	0.0192	0.0768		--	0.0096		0.5	0.0		0.8%	0.0%	
1,2,3,7,8-PeCDD	0.654	2.616		E	0.327		1	0.3		55.4%	0.0%	
1,2,3,4,7,8-HxCDF	0.244	0.976		E	0.122		0.1	0.0		2.1%	0.0%	
1,2,3,6,7,8-HxCDF	0.00915	0.0366		--	0.004575		0.1	0.0		0.1%	0.0%	
2,3,4,6,7,8-HxCDF	0.011	0.044	0.328	--	<5x*B	0.328	0.328	0.1	0.0	0.0	5.6%	
1,2,3,7,8,9-HxCDF	0.016	0.064	0.775	--	<5x*B	0.775	0.775	0.1	0.1	0.1	13.1%	
1,2,3,4,7,8-HxCDD	0.503	2.012		E	0.2515		0.1	0.0		4.3%	0.0%	
1,2,3,6,7,8-HxCDD	0.325	1.3		E	0.1625		0.1	0.0		2.8%	0.0%	
1,2,3,7,8,9-HxCDD	0.166	0.664		EJ	0.083		0.1	0.0		1.4%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.588	2.352		EI	0.294		0.01	0.0		0.5%	0.0%	
1,2,3,4,7,8,9-HpCDF	0.292	1.168		E	0.146		0.01	0.0		0.3%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.76	3.04		E	0.38		0.01	0.0		0.6%	0.0%	
OCDF	1.39	5.56		E	0.695		0.0001	0.0		0.0%	0.0%	
OCDD	0.0502	0.2008	3.82	--	<5x*B	3.82	3.82	0.0001	0.0	0.0	0.1%	
PCB-77	0.0985	0.394	3.47	--	<5x*B	3.47	3.47	0.0001	0.0	0.0	0.1%	
PCB-81	0.0948	0.3792	0.914	--	<5x*B	0.914	0.914	0.0001	0.0	0.0	0.0%	
PCB-105	0.58	2.32	18.5	--	<5x*B	18.5	18.5	0.0001	0.0	0.0	0.3%	
PCB-114	0.606	2.424		--		0.303		0.0005	0.0		0.0%	
PCB-118	0.665	2.66	40.6	--	<5x*B	40.6	40.6	0.0001	0.0	0.0	0.7%	
PCB-123	0.756	3.024		--		0.378		0.0001	0.0		0.0%	
PCB-126	0.148	0.592	0.488	--	<5x*B	0.488	0.244	0.1	0.0	0.0	8.3%	
PCB-156	0.448	1.792	4.54	--	<5x*B	4.54	4.54	0.0005	0.0	0.0	0.4%	
PCB-157	1.45	5.8		E	0.725		0.0005	0.0		0.1%	0.0%	
PCB-167	1.84	7.36		E	0.92		0.00001	0.0		0.0%	0.0%	
PCB-169	0.466	1.864		E	0.233		0.01	0.0		0.4%	0.0%	
PCB-189	0.153	0.612		--	0.0765		0.0001	0.0		0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
0.5	0.1	0.1	0.0	0.6	0.1

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAWLC	<i>Lab Spike</i>											
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.00153	0.0061	18.6	--		18.6	18.6	0.1	1.9	1.9	0.7%	0.7%	
2,3,7,8-TCDD	0.00248	0.0099	18.9	--		18.9	18.9	1	18.9	18.9	6.9%	6.9%	
1,2,3,7,8-PeCDF	0.00191	0.0076	111	--		111	111	0.05	5.6	5.6	2.0%	2.0%	
2,3,4,7,8-PeCDF	0.00146	0.0058	98.7	--		98.7	98.7	0.5	49.4	49.4	18.1%	18.1%	
1,2,3,7,8-PeCDD	0.00252	0.0101	107	--		107	107	1	107.0	107.0	39.2%	39.2%	
1,2,3,4,7,8-HxCDF	0.0164	0.0656	90.6	--		90.6	90.6	0.1	9.1	9.1	3.3%	3.3%	
1,2,3,6,7,8-HxCDF	0.013	0.052	82.1	--		82.1	82.1	0.1	8.2	8.2	3.0%	3.0%	
2,3,4,6,7,8-HxCDF	0.0168	0.0672	90.7	--		90.7	90.7	0.1	9.1	9.1	3.3%	3.3%	
1,2,3,7,8,9-HxCDF	0.0213	0.0852	86.2	--		86.2	86.2	0.1	8.6	8.6	3.2%	3.2%	
1,2,3,4,7,8-HxCDD	0.00211	0.0084	106	--		106	106	0.1	10.6	10.6	3.9%	3.9%	
1,2,3,6,7,8-HxCDD	0.00227	0.0091	87.2	--		87.2	87.2	0.1	8.7	8.7	3.2%	3.2%	
1,2,3,7,8,9-HxCDD	0.00228	0.0091	87.9	--		87.9	87.9	0.1	8.8	8.8	3.2%	3.2%	
1,2,3,4,6,7,8-HpCDF	0.0201	0.0804	80	--		80	80	0.01	0.8	0.8	0.3%	0.3%	
1,2,3,4,7,8,9-HpCDF	0.0259	0.1036	99.9	--		99.9	99.9	0.01	1.0	1.0	0.4%	0.4%	
1,2,3,4,6,7,8-HpCDD	0.00162	0.0065	98.9	--		98.9	98.9	0.01	1.0	1.0	0.4%	0.4%	
OCDF	0.00149	0.006	203	--		203	203	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.00296	0.0118	196	--		196	196	0.0001	0.0	0.0	0.0%	0.0%	
PCB-77	0.102	0.408	219	--		219	219	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.113	0.452	229	--		229	229	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.379	1.516	212	--		212	212	0.0001	0.0	0.0	0.0%	0.0%	
PCB-114	0.376	1.504	191	--		191	191	0.0005	0.1	0.1	0.0%	0.0%	
PCB-118	0.304	1.216	234	--		234	234	0.0001	0.0	0.0	0.0%	0.0%	
PCB-123	0.342	1.368	209	--		209	209	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.157	0.628	219	--		219	219	0.1	21.9	21.9	8.0%	8.0%	
PCB-156	0.237	0.948	212	--		212	212	0.0005	0.1	0.1	0.0%	0.0%	
PCB-157	0.249	0.996	223	--		223	223	0.0005	0.1	0.1	0.0%	0.0%	
PCB-167	0.23	0.92	220	--		220	220	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.095	0.38	202	--		202	202	0.01	2.0	2.0	0.7%	0.7%	
PCB-189	0.103	0.412	204	--		204	204	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
248.6	248.6	24.4	24.4	272.9	272.9

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAXLCS	<i>Lab Spike</i>										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0518	0.2072	19.1	--		19.1	19.1	0.1	1.9	1.9	0.8%	0.8%
2,3,7,8-TCDD	0.049	0.196	16.7	--		16.7	16.7	1	16.7	16.7	6.7%	6.7%
1,2,3,7,8-PeCDF	0.0708	0.2832	106	--		106	106	0.05	5.3	5.3	2.1%	2.1%
2,3,4,7,8-PeCDF	0.0518	0.2072	94.3	--		94.3	94.3	0.5	47.2	47.2	18.8%	18.8%
1,2,3,7,8-PeCDD	0.0658	0.2632	93.4	--		93.4	93.4	1	93.4	93.4	37.3%	37.3%
1,2,3,4,7,8-HxCDF	0.0437	0.1748	91.5	--		91.5	91.5	0.1	9.2	9.2	3.7%	3.7%
1,2,3,6,7,8-HxCDF	0.0381	0.1524	79.8	--		79.8	79.8	0.1	8.0	8.0	3.2%	3.2%
2,3,4,6,7,8-HxCDF	0.0429	0.1716	88.1	--		88.1	88.1	0.1	8.8	8.8	3.5%	3.5%
1,2,3,7,8,9-HxCDF	0.0494	0.1976	84.1	--		84.1	84.1	0.1	8.4	8.4	3.4%	3.4%
1,2,3,4,7,8-HxCDD	0.0101	0.0404	92.2	--		92.2	92.2	0.1	9.2	9.2	3.7%	3.7%
1,2,3,6,7,8-HxCDD	0.00864	0.0346	85	--		85	85	0.1	8.5	8.5	3.4%	3.4%
1,2,3,7,8,9-HxCDD	0.00963	0.0385	91.6	--		91.6	91.6	0.1	9.2	9.2	3.7%	3.7%
1,2,3,4,6,7,8-HpCDF	0.0624	0.2496	76.3	--		76.3	76.3	0.01	0.8	0.8	0.3%	0.3%
1,2,3,4,7,8,9-HpCDF	0.0843	0.3372	97	--		97	97	0.01	1.0	1.0	0.4%	0.4%
1,2,3,4,6,7,8-HpCDD	0.0101	0.0404	96	--		96	96	0.01	1.0	1.0	0.4%	0.4%
OCDF	0.0263	0.1052	188	--		188	188	0.0001	0.0	0.0	0.0%	0.0%
OCDD	0.00166	0.0066	191	--		191	191	0.0001	0.0	0.0	0.0%	0.0%
PCB-77	0.123	0.492	195	--		195	195	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.169	0.676	204	--		204	204	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.866	3.464	246	--		246	246	0.0001	0.0	0.0	0.0%	0.0%
PCB-114	0.86	3.44	225	--		225	225	0.0005	0.1	0.1	0.0%	0.0%
PCB-118	0.752	3.008	288	J	<5x*B	288	144	0.0001	0.0	0.0	0.0%	0.0%
PCB-123	0.846	3.384	232	--		232	232	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.183	0.732	194	--		194	194	0.1	19.4	19.4	7.8%	7.8%
PCB-156	0.271	1.084	209	--		209	209	0.0005	0.1	0.1	0.0%	0.0%
PCB-157	0.286	1.144	222	--		222	222	0.0005	0.1	0.1	0.0%	0.0%
PCB-167	0.264	1.056	252	J		252	126	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0812	0.3248	198	--		198	198	0.01	2.0	2.0	0.8%	0.8%
PCB-189	0.136	0.544	211	--		211	211	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
228.4	228.4	21.8	21.8	250.3	250.3

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GAAYLCS	<i>Lab Spike</i>		Quality Control Results								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0384	0.1536	16.9	--		16.9	16.9	0.1	1.7	1.7	0.6%	0.7%
2,3,7,8-TCDD	0.0401	0.1604	17.1	--		17.1	17.1	1	17.1	17.1	6.5%	6.6%
1,2,3,7,8-PeCDF	0.0475	0.19	107	--		107	107	0.05	5.4	5.4	2.0%	2.1%
2,3,4,7,8-PeCDF	0.0319	0.1276	90.4	--		90.4	90.4	0.5	45.2	45.2	17.1%	17.3%
1,2,3,7,8-PeCDD	0.0709	0.2836	108	--		108	108	1	108.0	108.0	41.0%	41.4%
1,2,3,4,7,8-HxCDF	0.0125	0.05	91.9	--		91.9	91.9	0.1	9.2	9.2	3.5%	3.5%
1,2,3,6,7,8-HxCDF	0.0107	0.0428	80.8	--		80.8	80.8	0.1	8.1	8.1	3.1%	3.1%
2,3,4,6,7,8-HxCDF	0.014	0.056	88.4	--		88.4	88.4	0.1	8.8	8.8	3.4%	3.4%
1,2,3,7,8,9-HxCDF	0.0199	0.0796	86.3	--		86.3	86.3	0.1	8.6	8.6	3.3%	3.3%
1,2,3,4,7,8-HxCDD	0.00778	0.0311	111	--		111	111	0.1	11.1	11.1	4.2%	4.3%
1,2,3,6,7,8-HxCDD	0.0056	0.0224	76.8	--		76.8	76.8	0.1	7.7	7.7	2.9%	3.0%
1,2,3,7,8,9-HxCDD	0.00667	0.0267	62	J		62	31	0.1	6.2	3.1	2.4%	1.2%
1,2,3,4,6,7,8-HpCDF	0.0805	0.322	80.6	--		80.6	80.6	0.01	0.8	0.8	0.3%	0.3%
1,2,3,4,7,8,9-HpCDF	0.163	0.652	99.2	--		99.2	99.2	0.01	1.0	1.0	0.4%	0.4%
1,2,3,4,6,7,8-HpCDD	0.00539	0.0216	94.5	--		94.5	94.5	0.01	0.9	0.9	0.4%	0.4%
OCDF	0.0185	0.074	232	--		232	232	0.0001	0.0	0.0	0.0%	0.0%
OCDD	0.00701	0.0280	186	--		186	186	0.0001	0.0	0.0	0.0%	0.0%
PCB-77	0.064	0.256	213	--		213	213	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.0907	0.3628	218	--		218	218	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	1.23	4.92	237	--		237	237	0.0001	0.0	0.0	0.0%	0.0%
PCB-114	1.28	5.12	217	--		217	217	0.0005	0.1	0.1	0.0%	0.0%
PCB-118	1.38	5.52	258	J		258	129	0.0001	0.0	0.0	0.0%	0.0%
PCB-123	1.57	6.28	233	--		233	233	0.0001	0.0	0.0	0.0%	0.0%
PCB-126	0.18	0.72	213	--		213	213	0.1	21.3	21.3	8.1%	8.2%
PCB-156	0.818	3.272	211	--		211	211	0.0005	0.1	0.1	0.0%	0.0%
PCB-157	0.846	3.384	217	--		217	217	0.0005	0.1	0.1	0.0%	0.0%
PCB-167	0.832	3.328	212	--		212	212	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0912	0.3648	213	--		213	213	0.01	2.1	2.1	0.8%	0.8%
PCB-189	0.174	0.696	209	--		209	209	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
239.8	236.7	23.9	23.9	263.7	260.6

APPENDIX A2. Quality Control Results

FINAL

Sample ID	GBAELCS	<i>Lab Spike</i>											
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.037	0.148	20.6	--		20.6	20.6	0.1	2.1	2.1	0.7%	0.7%	
2,3,7,8-TCDD	0.0134	0.0536	20.1	--		20.1	20.1	1	20.1	20.1	7.1%	7.2%	
1,2,3,7,8-PeCDF	0.0924	0.3696	124	--		124	124	0.05	6.2	6.2	2.2%	2.2%	
2,3,4,7,8-PeCDF	0.0496	0.1984	103	--		103	103	0.5	51.5	51.5	18.3%	18.5%	
1,2,3,7,8-PeCDD	0.0571	0.2284	110	--		110	110	1	110.0	110.0	39.1%	39.4%	
1,2,3,4,7,8-HxCDF	0.0669	0.2676	95.5	--		95.5	95.5	0.1	9.6	9.6	3.4%	3.4%	
1,2,3,6,7,8-HxCDF	0.077	0.308	92.3	--		92.3	92.3	0.1	9.2	9.2	3.3%	3.3%	
2,3,4,6,7,8-HxCDF	0.103	0.412	104	--		104	104	0.1	10.4	10.4	3.7%	3.7%	
1,2,3,7,8,9-HxCDF	0.179	0.716	90.6	--		90.6	90.6	0.1	9.1	9.1	3.2%	3.3%	
1,2,3,4,7,8-HxCDD	0.0278	0.1112	100	--		100	100	0.1	10.0	10.0	3.6%	3.6%	
1,2,3,6,7,8-HxCDD	0.0237	0.0948	89.3	--		89.3	89.3	0.1	8.9	8.9	3.2%	3.2%	
1,2,3,7,8,9-HxCDD	0.0264	0.1056	52	J		52	26	0.1	5.2	2.6	1.9%	0.9%	
1,2,3,4,6,7,8-HpCDF	0.0703	0.2812	82.1	--		82.1	82.1	0.01	0.8	0.8	0.3%	0.3%	
1,2,3,4,7,8,9-HpCDF	0.144	0.576	94.3	--		94.3	94.3	0.01	0.9	0.9	0.3%	0.3%	
1,2,3,4,6,7,8-HpCDD	0.0988	0.3952	98.9	--		98.9	98.9	0.01	1.0	1.0	0.4%	0.4%	
OCDF	0.157	0.628	177	--		177	177	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.126	0.504	208	--		208	208	0.0001	0.0	0.0	0.0%	0.0%	
PCB-77	0.0923	0.3692	234	--		234	234	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0884	0.3536	226	--		226	226	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.831	3.324	238	--		238	238	0.0001	0.0	0.0	0.0%	0.0%	
PCB-114	0.869	3.476	229	--		229	229	0.0005	0.1	0.1	0.0%	0.0%	
PCB-118	0.954	3.816	246	--		246	246	0.0001	0.0	0.0	0.0%	0.0%	
PCB-123	1.08	4.32	225	--		225	225	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.172	0.688	238	--		238	238	0.1	23.8	23.8	8.5%	8.5%	
PCB-156	1.69	6.76	223	--		223	223	0.0005	0.1	0.1	0.0%	0.0%	
PCB-157	1.75	7	227	--		227	227	0.0005	0.1	0.1	0.0%	0.0%	
PCB-167	1.72	6.88	229	--		229	229	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.121	0.484	236	--		236	236	0.01	2.4	2.4	0.8%	0.9%	
PCB-189	0.216	0.864	218	--		218	218	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
255.0	252.4	26.6	26.6	281.7	279.1

APPENDIX A2. Quality Control Results

FINAL

Sample ID	113	PE Clean	Ref-F-22										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.737	2.948		--	0.3685		0.1	0.0			3.2%	0.0%	
2,3,7,8-TCDD	0.0986	0.3944		--	0.0493		1	0.0			4.3%	0.0%	
1,2,3,7,8-PeCDF	0.213	0.852		--	0.1065		0.05	0.0			0.5%	0.0%	
2,3,4,7,8-PeCDF	0.156	0.624		--	0.078		0.5	0.0			3.4%	0.0%	
1,2,3,7,8-PeCDD	0.0934	0.3736		--	0.0467		1	0.0			4.1%	0.0%	
1,2,3,4,7,8-HxCDF	1.14	4.56		D	0.285		0.1	0.0			2.5%	0.0%	
1,2,3,6,7,8-HxCDF	0.513	2.052		E	0.2565		0.1	0.0			2.2%	0.0%	
2,3,4,6,7,8-HxCDF	0.538	2.152		--	0.269		0.1	0.0			2.4%	0.0%	
1,2,3,7,8,9-HxCDF	0.976	3.904		--	<5x*B	0.488		0.1	0.0			4.3%	0.0%
1,2,3,4,7,8-HxCDD	0.14	0.56	1	B	<5x*B	1	0.5	0.1	0.1	0.1		8.7%	7.9%
1,2,3,6,7,8-HxCDD	0.121	0.484	1.71	I		1.71	1.71	0.1	0.2	0.2		15.0%	27.1%
1,2,3,7,8,9-HxCDD	0.571	2.284		E		0.2855		0.1	0.0			2.5%	0.0%
1,2,3,4,6,7,8-HpCDF	31.2	124.8		D	<5x*B	7.8		0.01	0.1			6.8%	0.0%
1,2,3,4,7,8,9-HpCDF	2.61	10.44		E		1.305		0.01	0.0			1.1%	0.0%
1,2,3,4,6,7,8-HpCDD	0.471	1.884	33.2	--	33.2	33.2	0.01	0.3	0.3			29.0%	52.6%
OCDF	0.67	2.68	45	--		45	45	0.0001	0.0	0.0		0.4%	0.7%
OCDD	0.676	2.704	271	--		271	271	0.0001	0.0	0.0		2.4%	4.3%
PCB-77	4.02	16.08		E	<5x*B	2.01		0.0001	0.0			0.0%	0.0%
PCB-81	0.116	0.464	0.382	B	<5x*B	0.382	0.0955	0.0001	0.0	0.0		0.0%	0.0%
PCB-105	0.77	3.08	83.9	--		83.9	83.9	0.0001	0.0	0.0		0.7%	1.3%
PCB-114	0.765	3.06	4.52	B	<5x*B	4.52	2.26	0.0005	0.0	0.0		0.2%	0.2%
PCB-118	0.67	2.68	189	--		189	189	0.0001	0.0	0.0		1.7%	3.0%
PCB-123	0.754	3.016		--		0.377		0.0001	0.0			0.0%	0.0%
PCB-126	0.666	2.664		E		0.333		0.1	0.0			2.9%	0.0%
PCB-156	0.328	1.312	29.1	--		29.1	29.1	0.0005	0.0	0.0		1.3%	2.3%
PCB-157	0.346	1.384	7.55	--		7.55	7.55	0.0005	0.0	0.0		0.3%	0.6%
PCB-167	0.319	1.276	12	--		12	12	0.00001	0.0	0.0		0.0%	0.0%
PCB-169	0.0374	0.1496		--		0.0187		0.01	0.0			0.0%	0.0%
PCB-189	1.91	7.64		E		0.955		0.0001	0.0			0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.1	0.6	0.1	0.0	1.1	0.6

APPENDIX A2. Quality Control Results

FINAL

Sample ID	172	PE Clean		Ref-F-23									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0008	0.0032		--	0.000399		0.1	0.0			0.0%	0.0%	
2,3,7,8-TCDD	0.00265	0.0106		--	0.001325		1	0.0			0.0%	0.0%	
1,2,3,7,8-PeCDF	0.00633	0.0253		--	0.003165		0.05	0.0			0.0%	0.0%	
2,3,4,7,8-PeCDF	0.115	0.46		E	0.0575		0.5	0.0			1.0%	0.0%	
1,2,3,7,8-PeCDD	0.003	0.012	0.513	--	0.513	0.513	1	0.5	0.5	0.5	17.4%	18.6%	
1,2,3,4,7,8-HxCDF	0.0959	0.3836	0.516	--	0.516	0.516	0.1	0.1	0.1	0.1	1.7%	1.9%	
1,2,3,6,7,8-HxCDF	0.075	0.3	0.414	--	0.414	0.414	0.1	0.0	0.0	0.0	1.4%	1.5%	
2,3,4,6,7,8-HxCDF	0.0918	0.3672	1.07	--	1.07	1.07	0.1	0.1	0.1	0.1	3.6%	3.9%	
1,2,3,7,8,9-HxCDF	0.316	1.264		E	<5x*B	0.158		0.1	0.0			0.5%	0.0%
1,2,3,4,7,8-HxCDD	0.00078	0.0031	0.942	--	0.942	0.942	0.1	0.1	0.1	0.1	3.2%	3.4%	
1,2,3,6,7,8-HxCDD	0.00083	0.0033	2.39	--	2.39	2.39	0.1	0.2	0.2	0.2	8.1%	8.6%	
1,2,3,7,8,9-HxCDD	0.00084	0.0034	1.07	--	1.07	1.07	0.1	0.1	0.1	0.1	3.6%	3.9%	
1,2,3,4,6,7,8-HpCDF	0.0501	0.2004	9.53	--	9.53	9.53	0.01	0.1	0.1	0.1	3.2%	3.4%	
1,2,3,4,7,8,9-HpCDF	0.878	3.512		E	0.439		0.01	0.0			0.1%	0.0%	
1,2,3,4,6,7,8-HpCDD	0.111	0.444	137	--	137	137	0.01	1.4	1.4	1.4	46.4%	49.6%	
OCDF	0.00802	0.0321	41.1	--	41.1	41.1	0.0001	0.0	0.0	0.0	0.1%	0.1%	
OCDD	0.0166	0.0664	1360	CJ	1360	680	0.0001	0.1	0.1	0.1	4.6%	2.5%	
PCB-77	0.0942	0.3768	3.5	B	<5x*B	3.5	1.75	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.109	0.436	0.48	B	<5x*B	0.48	0.24	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.189	0.756	89	B	<5x*B	89	44.5	0.0001	0.0	0.0	0.3%	0.2%	
PCB-114	0.188	0.752	4.34	--	4.34	4.34	0.0005	0.0	0.0	0.0	0.1%	0.1%	
PCB-118	0.163	0.652	198	B	<5x*B	198	99	0.0001	0.0	0.0	0.7%	0.4%	
PCB-123	0.183	0.732	4.89	B	<5x*B	4.89	2.445	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.107	0.428	0.908	BJ	<5x*B	0.908	0.454	0.1	0.1	0.0	3.1%	1.6%	
PCB-156	0.13	0.52	32.1	B	<5x*B	32.1	16.05	0.0005	0.0	0.0	0.5%	0.3%	
PCB-157	0.137	0.548	7.88	B	<5x*B	7.88	3.94	0.0005	0.0	0.0	0.1%	0.1%	
PCB-167	0.126	0.504	9.12	B	<5x*B	9.12	4.56	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0475	0.19		--	0.02375		0.01	0.0			0.0%	0.0%	
PCB-189	0.217	0.868	2.24	--	2.24	2.24	0.0001	0.0	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
2.8	2.7	0.1	0.1	3.0	2.8

APPENDIX A2. Quality Control Results

FINAL

Sample ID	256	PE Clean	Ref-F-24										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0108	0.0432	0.129	NJ		0.0645		0.1	0.0		0.5%	0.0%	
2,3,7,8-TCDD	0.00188	0.0075		--		0.00094		1	0.0		0.1%	0.0%	
1,2,3,7,8-PeCDF	0.179	0.716		ED		0.04475		0.05	0.0		0.2%	0.0%	
2,3,4,7,8-PeCDF	0.209	0.836		E		0.1045		0.5	0.1		4.4%	0.0%	
1,2,3,7,8-PeCDD	0.0421	0.1684		--		0.02105		1	0.0		1.8%	0.0%	
1,2,3,4,7,8-HxCDF	0.042	0.168	0.513	--		0.513	0.513	0.1	0.1	0.1	4.3%	5.0%	
1,2,3,6,7,8-HxCDF	0.387	1.548		E	<5x*B	0.1935		0.1	0.0		1.6%	0.0%	
2,3,4,6,7,8-HxCDF	0.0434	0.1736		--		0.0217		0.1	0.0		0.2%	0.0%	
1,2,3,7,8,9-HxCDF	0.0481	0.1924	0.369	--		0.369	0.369	0.1	0.0	0.0	3.1%	3.6%	
1,2,3,4,7,8-HxCDD	0.0109	0.0436	0.999	--		0.999	0.999	0.1	0.1	0.1	8.5%	9.8%	
1,2,3,6,7,8-HxCDD	0.00824	0.033	1.67	--		1.67	1.67	0.1	0.2	0.2	14.1%	16.4%	
1,2,3,7,8,9-HxCDD	0.00965	0.0386	1.18	J		1.18	0.59	0.1	0.1	0.1	10.0%	5.8%	
1,2,3,4,6,7,8-HpCDF	0.0259	0.1036	5.76	--		5.76	5.76	0.01	0.1	0.1	4.9%	5.7%	
1,2,3,4,7,8,9-HpCDF	0.0384	0.1536	0.51	--		0.51	0.51	0.01	0.0	0.0	0.4%	0.5%	
1,2,3,4,6,7,8-HpCDD	0.0376	0.1504	38.3	--		38.3	38.3	0.01	0.4	0.4	32.4%	37.7%	
OCDF	0.0137	0.0548	8.95	--		8.95	8.95	0.0001	0.0	0.0	0.1%	0.1%	
OCDD	0.0154	0.0616	291	--		291	291	0.0001	0.0	0.0	2.5%	2.9%	
PCB-77	0.0433	0.1732	4.24	B	<5x*B	4.24	2.12	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0532	0.2128	0.499	B	<5x*B	0.499	0.2495	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.298	1.192	77.5	--		77.5	77.5	0.0001	0.0	0.0	0.7%	0.8%	
PCB-114	0.311	1.244	4.35	B	<5x*B	4.35	2.175	0.0005	0.0	0.0	0.2%	0.1%	
PCB-118	0.328	1.312	163	--		163	163	0.0001	0.0	0.0	1.4%	1.6%	
PCB-123	0.373	1.492	3.7	BJ	<5x*B	3.7	1.85	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.0986	0.3944	0.837	--		0.837	0.837	0.1	0.1	0.1	7.1%	8.2%	
PCB-156	0.151	0.604	25.4	--		25.4	25.4	0.0005	0.0	0.0	1.1%	1.2%	
PCB-157	0.156	0.624	6.78	--		6.78	6.78	0.0005	0.0	0.0	0.3%	0.3%	
PCB-167	0.154	0.616	10.9	--		10.9	10.9	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0411	0.1644	0.172	--		0.172	0.172	0.01	0.0	0.0	0.1%	0.2%	
PCB-189	0.227	0.908	1.88	--		1.88	1.88	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.1	0.9	0.1	0.1	1.2	1.0

APPENDIX A2. Quality Control Results

FINAL

Sample ID	339	PE Clean	Ref-F-27										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0504	0.2016		--		0.0252		0.1	0.0		0.1%	0.0%	
2,3,7,8-TCDD	0.0161	0.0644		--		0.00805		1	0.0		0.4%	0.0%	
1,2,3,7,8-PeCDF	0.322	1.288		E		0.161		0.05	0.0		0.4%	0.0%	
2,3,4,7,8-PeCDF	0.0359	0.1436	0.273	--		0.273	0.273	0.5	0.1	0.1	6.8%	7.9%	
1,2,3,7,8-PeCDD	0.0443	0.1772	0.767	--		0.767	0.767	1	0.8	0.8	38.2%	44.1%	
1,2,3,4,7,8-HxCDF	0.111	0.444	0.627	--		0.627	0.627	0.1	0.1	0.1	3.1%	3.6%	
1,2,3,6,7,8-HxCDF	0.0925	0.37	0.559	I		0.559	0.559	0.1	0.1	0.1	2.8%	3.2%	
2,3,4,6,7,8-HxCDF	0.144	0.576	0.56	B	<5x*B	0.56	0.14	0.1	0.1	0.0	2.8%	0.8%	
1,2,3,7,8,9-HxCDF	0.212	0.848	0.568	B	<5x*B	0.568	0.142	0.1	0.1	0.0	2.8%	0.8%	
1,2,3,4,7,8-HxCDD	0.749	2.996		E		0.3745		0.1	0.0		1.9%	0.0%	
1,2,3,6,7,8-HxCDD	0.0416	0.1664	1.66	I		1.66	1.66	0.1	0.2	0.2	8.3%	9.6%	
1,2,3,7,8,9-HxCDD	0.0469	0.1876	0.788	IJ		0.788	0.394	0.1	0.1	0.0	3.9%	2.3%	
1,2,3,4,6,7,8-HpCDF	5.91	23.64		D		1.4775		0.01	0.0		0.7%	0.0%	
1,2,3,4,7,8,9-HpCDF	0.0783	0.3132	0.579	--		0.579	0.579	0.01	0.0	0.0	0.3%	0.3%	
1,2,3,4,6,7,8-HpCDD	0.126	0.504	36.7	--		36.7	36.7	0.01	0.4	0.4	18.3%	21.1%	
OCDF	0.0259	0.1036	7.13	J		7.13	3.565	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0841	0.3364	296	--		296	296	0.0001	0.0	0.0	1.5%	1.7%	
PCB-77	0.0839	0.3356	9.03	B	<5x*B	9.03	4.515	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0815	0.326	0.676	B	<5x*B	0.676	0.338	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.444	1.776	85.8	B	<5x*B	85.8	42.9	0.0001	0.0	0.0	0.4%	0.2%	
PCB-114	0.464	1.856	5.07	--		5.07	5.07	0.0005	0.0	0.0	0.1%	0.1%	
PCB-118	0.497	1.988	187	B	<5x*B	187	93.5	0.0001	0.0	0.0	0.9%	0.5%	
PCB-123	0.565	2.26		--		0.2825		0.0001	0.0		0.0%	0.0%	
PCB-126	0.175	0.7	1.08	BJ	<5x*B	1.08	0.54	0.1	0.1	0.1	5.4%	3.1%	
PCB-156	1.22	4.88	21.3	B	<5x*B	21.3	10.65	0.0005	0.0	0.0	0.5%	0.3%	
PCB-157	1.26	5.04	5.59	--		5.59	5.59	0.0005	0.0	0.0	0.1%	0.2%	
PCB-167	1.24	4.96	12.7	--		12.7	12.7	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.0796	0.3184	0.226	J		0.226	0.0565	0.01	0.0	0.0	0.1%	0.0%	
PCB-189	0.881	3.524	1.88	--		1.88	0.94	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.9	1.7	0.2	0.1	2.0	1.7

APPENDIX A2. Quality Control Results

FINAL

Sample ID	681	PE Clean	blank										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0216	0.0864	0.194	NJ		0.097		0.1	0.0		0.4%	0.0%	
2,3,7,8-TCDD	0.00469	0.0188		--		0.002345		1	0.0		0.1%	0.0%	
1,2,3,7,8-PeCDF	0.0726	0.2904	0.411	--		0.411	0.411	0.05	0.0	0.0	0.8%	0.9%	
2,3,4,7,8-PeCDF	0.0458	0.1832	0.368	--		0.368	0.368	0.5	0.2	0.2	7.1%	7.7%	
1,2,3,7,8-PeCDD	0.0173	0.0692	0.845	--		0.845	0.845	1	0.8	0.8	32.5%	35.4%	
1,2,3,4,7,8-HxCDF	0.0282	0.1128	0.711	--		0.711	0.711	0.1	0.1	0.1	2.7%	3.0%	
1,2,3,6,7,8-HxCDF	0.0355	0.142	0.497	--		0.497	0.497	0.1	0.0	0.0	1.9%	2.1%	
2,3,4,6,7,8-HxCDF	0.0387	0.1548	0.585	B	<5x*B	0.585	0.2925	0.1	0.1	0.0	2.3%	1.2%	
1,2,3,7,8,9-HxCDF	0.0526	0.2104	0.611	B	<5x*B	0.611	0.3055	0.1	0.1	0.0	2.4%	1.3%	
1,2,3,4,7,8-HxCDD	0.00953	0.0381	0.989	--		0.989	0.989	0.1	0.1	0.1	3.8%	4.1%	
1,2,3,6,7,8-HxCDD	0.00837	0.0335	2.03	--		2.03	2.03	0.1	0.2	0.2	7.8%	8.5%	
1,2,3,7,8,9-HxCDD	1.24	4.96		EJ		0.62		0.1	0.1		2.4%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.0329	0.1316	5.7	I		5.7	5.7	0.01	0.1	0.1	2.2%	2.4%	
1,2,3,4,7,8,9-HpCDF	0.0472	0.1888	0.576	--		0.576	0.576	0.01	0.0	0.0	0.2%	0.2%	
1,2,3,4,6,7,8-HpCDD	0.0335	0.134	57.8	--		57.8	57.8	0.01	0.6	0.6	22.2%	24.2%	
OCDF	0.0154	0.0616	8.8	--		8.8	8.8	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0217	0.0868	638	--		638	638	0.0001	0.1	0.1	2.5%	2.7%	
PCB-77	0.0498	0.1992	10.3	B	<5x*B	10.3	5.15	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0495	0.198	1.03	BJ	<5x*B	1.03	0.515	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	2.56	10.24	139	--		139	139	0.0001	0.0	0.0	0.5%	0.6%	
PCB-114	2.67	10.68	7.61	--		7.61	3.805	0.0005	0.0	0.0	0.2%	0.1%	
PCB-118	3.06	12.24	308	--		308	308	0.0001	0.0	0.0	1.2%	1.3%	
PCB-123	3.48	13.92	7.52	--		7.52	3.76	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.143	0.572	1.48	BJ	<5x*B	1.48	0.74	0.1	0.1	0.1	5.7%	3.1%	
PCB-156	0.323	1.292	43.3	--		43.3	43.3	0.0005	0.0	0.0	0.8%	0.9%	
PCB-157	0.334	1.336	11	--		11	11	0.0005	0.0	0.0	0.2%	0.2%	
PCB-167	0.329	1.316	17.3	--		17.3	17.3	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.481	1.924		E		0.2405		0.01	0.0		0.1%	0.0%	
PCB-189	0.243	0.972	2.91	--		2.91	2.91	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
2.4	2.2	0.2	0.1	2.6	2.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	263	PE Low Std	PEL-F-11										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.00134	0.0054	3.84	NJ		1.92		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.00329	0.0132	10.8	--		10.8	10.8	1	10.8	10.8	15.7%	15.8%	
1,2,3,7,8-PeCDF	0.0114	0.0456	106	--		106	106	0.05	5.3	5.3	7.7%	7.8%	
2,3,4,7,8-PeCDF	0.00749	0.03	27.4	--		27.4	27.4	0.5	13.7	13.7	19.9%	20.0%	
1,2,3,7,8-PeCDD	0.003	0.012	18	--		18	18	1	18.0	18.0	26.1%	26.3%	
1,2,3,4,7,8-HxCDF	0.0573	0.2292	27.9	--		27.9	27.9	0.1	2.8	2.8	4.1%	4.1%	
1,2,3,6,7,8-HxCDF	0.0488	0.1952	1.88	--		1.88	1.88	0.1	0.2	0.2	0.3%	0.3%	
2,3,4,6,7,8-HxCDF	0.0503	0.2012	65.7	--		65.7	65.7	0.1	6.6	6.6	9.5%	9.6%	
1,2,3,7,8,9-HxCDF	0.0655	0.262	62	--		62	62	0.1	6.2	6.2	9.0%	9.1%	
1,2,3,4,7,8-HxCDD	0.0015	0.006	9.96	--		9.96	9.96	0.1	1.0	1.0	1.4%	1.5%	
1,2,3,6,7,8-HxCDD	0.00171	0.0068	13.7	--		13.7	13.7	0.1	1.4	1.4	2.0%	2.0%	
1,2,3,7,8,9-HxCDD	0.00168	0.0067	2.35	--		2.35	2.35	0.1	0.2	0.2	0.3%	0.3%	
1,2,3,4,6,7,8-HpCDF	0.0324	0.1296	6.66	--		6.66	6.66	0.01	0.1	0.1	0.1%	0.1%	
1,2,3,4,7,8,9-HpCDF	0.0687	0.2748	70.9	--		70.9	70.9	0.01	0.7	0.7	1.0%	1.0%	
1,2,3,4,6,7,8-HpCDD	0.0618	0.2472	99.4	--		99.4	99.4	0.01	1.0	1.0	1.4%	1.5%	
OCDF	0.0145	0.058	25.9	--		25.9	25.9	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.00527	0.0211	375	--		375	375	0.0001	0.0	0.0	0.1%	0.1%	
PCB-77	0.0538	0.2152	15.9	B	<5x*B	15.9	7.95	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0578	0.2312	0.85	B	<5x*B	0.85	0.425	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	1.12	4.48	615	CJ		615	307.5	0.0001	0.1	0.0	0.1%	0.0%	
PCB-114	1.12	4.48	30.1	--		30.1	30.1	0.0005	0.0	0.0	0.0%	0.0%	
PCB-118	0.933	3.732	1190	CJ		1190	595	0.0001	0.1	0.1	0.2%	0.1%	
PCB-123	1.05	4.2	22.5	--		22.5	22.5	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.189	0.756	3.62	J		3.62	1.81	0.1	0.4	0.2	0.5%	0.3%	
PCB-156	0.274	1.096	180	--		180	180	0.0005	0.1	0.1	0.1%	0.1%	
PCB-157	0.289	1.156	46.8	--		46.8	46.8	0.0005	0.0	0.0	0.0%	0.0%	
PCB-167	0.266	1.064	51.5	--		51.5	51.5	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	1.49	5.96	E			0.745		0.01	0.0		0.0%	0.0%	
PCB-189	0.0911	0.3644	7.72	--		7.72	7.72	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
68.2	68.0	0.7	0.4	68.8	68.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	498	PE Low Std	PEL-F-12										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.055	0.22	3.82	NJ		1.91		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.023	0.092	10.6	--		10.6	10.6	1	10.6	10.6	14.8%	14.9%	
1,2,3,7,8-PeCDF	0.0696	0.2784	107	--		107	107	0.05	5.4	5.4	7.5%	7.5%	
2,3,4,7,8-PeCDF	0.0558	0.2232	30.1	--		30.1	30.1	0.5	15.1	15.1	21.1%	21.2%	
1,2,3,7,8-PeCDD	0.0155	0.062	18.5	--		18.5	18.5	1	18.5	18.5	25.9%	26.1%	
1,2,3,4,7,8-HxCDF	0.0407	0.1628	29.3	--		29.3	29.3	0.1	2.9	2.9	4.1%	4.1%	
1,2,3,6,7,8-HxCDF	0.0397	0.1588	1.85	B	<5x*B	1.85	0.925	0.1	0.2	0.1	0.3%	0.1%	
2,3,4,6,7,8-HxCDF	0.0571	0.2284	72.3	--		72.3	72.3	0.1	7.2	7.2	10.1%	10.2%	
1,2,3,7,8,9-HxCDF	0.101	0.404	62.9	--		62.9	62.9	0.1	6.3	6.3	8.8%	8.9%	
1,2,3,4,7,8-HxCDD	0.0416	0.1664	10.4	--		10.4	10.4	0.1	1.0	1.0	1.5%	1.5%	
1,2,3,6,7,8-HxCDD	0.0349	0.1396	14.5	--		14.5	14.5	0.1	1.5	1.5	2.0%	2.0%	
1,2,3,7,8,9-HxCDD	0.0394	0.1576	1.65	J		1.65	0.825	0.1	0.2	0.1	0.2%	0.1%	
1,2,3,4,6,7,8-HpCDF	0.0994	0.3976	10.3	--		10.3	10.3	0.01	0.1	0.1	0.1%	0.1%	
1,2,3,4,7,8,9-HpCDF	0.241	0.964	65.2	--		65.2	65.2	0.01	0.7	0.7	0.9%	0.9%	
1,2,3,4,6,7,8-HpCDD	0.0729	0.2916	98	--		98	98	0.01	1.0	1.0	1.4%	1.4%	
OCDF	0.13	0.52	41	--		41	41	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.129	0.516	485	--		485	485	0.0001	0.0	0.0	0.1%	0.1%	
PCB-77	0.0535	0.214	16.2	--		16.2	16.2	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0605	0.242	0.859	B	<5x*B	0.859	0.4295	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	1.96	7.84	636	CJ		636	318	0.0001	0.1	0.0	0.1%	0.0%	
PCB-114	2.04	8.16	32.4	--		32.4	32.4	0.0005	0.0	0.0	0.0%	0.0%	
PCB-118	2.33	9.32	1330	CJ		1330	665	0.0001	0.1	0.1	0.2%	0.1%	
PCB-123	2.65	10.6	18.7	J		18.7	9.35	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.485	1.94	3.54	--		3.54	3.54	0.1	0.4	0.4	0.5%	0.5%	
PCB-156	0.226	0.904	188	--		188	188	0.0005	0.1	0.1	0.1%	0.1%	
PCB-157	0.234	0.936	42.2	--		42.2	42.2	0.0005	0.0	0.0	0.0%	0.0%	
PCB-167	0.23	0.92	62.7	--		62.7	62.7	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	1.07	4.28	E			0.535		0.01	0.0		0.0%	0.0%	
PCB-189	0.119	0.476	7.85	--		7.85	7.85	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
70.8	70.4	0.7	0.6	71.5	71.0

APPENDIX A2. Quality Control Results

FINAL

Sample ID	757-R	PE Low Std	PEL-F-7	Replacement sample for (757) which was lost by MRI; EPA batch C, sent w/ off-post									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0443	0.1772	3.91	NJ		1.955		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.0228	0.0912	11.8	--		11.8	11.8	1	11.8	11.8	16.1%	16.2%	
1,2,3,7,8-PeCDF	0.0312	0.1248	113	--		113	113	0.05	5.7	5.7	7.7%	7.8%	
2,3,4,7,8-PeCDF	0.0236	0.0944	30.1	--		30.1	30.1	0.5	15.1	15.1	20.6%	20.7%	
1,2,3,7,8-PeCDD	0.0151	0.0604	18	--		18	18	1	18.0	18.0	24.6%	24.8%	
1,2,3,4,7,8-HxCDF	0.0696	0.2784	30.1	--		30.1	30.1	0.1	3.0	3.0	4.1%	4.1%	
1,2,3,6,7,8-HxCDF	0.0622	0.2488	1.66	B	<5x*B	1.66	0.83	0.1	0.2	0.1	0.2%	0.1%	
2,3,4,6,7,8-HxCDF	0.0843	0.3372	72.3	--		72.3	72.3	0.1	7.2	7.2	9.9%	9.9%	
1,2,3,7,8,9-HxCDF	0.126	0.504	68.6	--		68.6	68.6	0.1	6.9	6.9	9.4%	9.4%	
1,2,3,4,7,8-HxCDD	0.0219	0.0876	10.7	--		10.7	10.7	0.1	1.1	1.1	1.5%	1.5%	
1,2,3,6,7,8-HxCDD	0.0176	0.0704	14.9	--		14.9	14.9	0.1	1.5	1.5	2.0%	2.1%	
1,2,3,7,8,9-HxCDD	0.0203	0.0812	2.15	J		2.15	1.075	0.1	0.2	0.1	0.3%	0.2%	
1,2,3,4,6,7,8-HpCDF	0.179	0.716	7.94	--		7.94	7.94	0.01	0.1	0.1	0.1%	0.1%	
1,2,3,4,7,8,9-HpCDF	0.348	1.392	66.7	--		66.7	66.7	0.01	0.7	0.7	0.9%	0.9%	
1,2,3,4,6,7,8-HpCDD	0.0942	0.3768	98.3	--		98.3	98.3	0.01	1.0	1.0	1.3%	1.4%	
OCDF	0.0654	0.2616	31.7	--		31.7	31.7	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0723	0.2892	397	--		397	397	0.0001	0.0	0.0	0.1%	0.1%	
PCB-77	0.0713	0.2852	16.5	--		16.5	16.5	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0868	0.3472	0.958	B	<5x*B	0.958	0.479	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	1.63	6.52	700	CJ		700	350	0.0001	0.1	0.0	0.1%	0.1%	
PCB-114	1.7	6.8	36.8	--		36.8	36.8	0.0005	0.0	0.0	0.0%	0.0%	
PCB-118	1.95	7.8	1390	CJ		1390	695	0.0001	0.1	0.1	0.2%	0.1%	
PCB-123	2.21	8.84	23.2	J		23.2	11.6	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.287	1.148	3.51	--		3.51	3.51	0.1	0.4	0.4	0.5%	0.5%	
PCB-156	0.254	1.016	197	--		197	197	0.0005	0.1	0.1	0.1%	0.1%	
PCB-157	0.263	1.052	43.3	--		43.3	43.3	0.0005	0.0	0.0	0.0%	0.0%	
PCB-167	0.258	1.032	67.4	--		67.4	67.4	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	1.54	6.16	E			0.77		0.01	0.0		0.0%	0.0%	
PCB-189	0.17	0.68	8.51	--		8.51	8.51	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
72.5	72.1	0.7	0.6	73.2	72.7

APPENDIX A2. Quality Control Results

FINAL

Sample ID	943	PE Low Std	PEL-F-10										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0252	0.1008	3.39	NJ		1.695		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.0112	0.0448	10.4	--		10.4	10.4	1	10.4	10.4	15.3%	15.4%	
1,2,3,7,8-PeCDF	0.0285	0.114	97.1	--		97.1	97.1	0.05	4.9	4.9	7.2%	7.2%	
2,3,4,7,8-PeCDF	0.0216	0.0864	26.4	--		26.4	26.4	0.5	13.2	13.2	19.5%	19.5%	
1,2,3,7,8-PeCDD	0.00115	0.0046	18.7	--		18.7	18.7	1	18.7	18.7	27.6%	27.7%	
1,2,3,4,7,8-HxCDF	0.0528	0.2112	28.5	--		28.5	28.5	0.1	2.9	2.9	4.2%	4.2%	
1,2,3,6,7,8-HxCDF	0.0473	0.1892	1.24	--		1.24	1.24	0.1	0.1	0.1	0.2%	0.2%	
2,3,4,6,7,8-HxCDF	0.0582	0.2328	64.7	--		64.7	64.7	0.1	6.5	6.5	9.5%	9.6%	
1,2,3,7,8,9-HxCDF	0.0836	0.3344	64.2	--		64.2	64.2	0.1	6.4	6.4	9.5%	9.5%	
1,2,3,4,7,8-HxCDD	0.0245	0.098	8.81	--		8.81	8.81	0.1	0.9	0.9	1.3%	1.3%	
1,2,3,6,7,8-HxCDD	0.0228	0.0912	13.3	--		13.3	13.3	0.1	1.3	1.3	2.0%	2.0%	
1,2,3,7,8,9-HxCDD	0.0244	0.0976	2.24	--		2.24	2.24	0.1	0.2	0.2	0.3%	0.3%	
1,2,3,4,6,7,8-HpCDF	11	44	D	<5x*B		2.75		0.01	0.0		0.0%	0.0%	
1,2,3,4,7,8,9-HpCDF	0.105	0.42	60.7	--		60.7	60.7	0.01	0.6	0.6	0.9%	0.9%	
1,2,3,4,6,7,8-HpCDD	0.0239	0.0956	90	--		90	90	0.01	0.9	0.9	1.3%	1.3%	
OCDF	0.0329	0.1316	30.7	--		30.7	30.7	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0459	0.1836	406	--		406	406	0.0001	0.0	0.0	0.1%	0.1%	
PCB-77	0.0807	0.3228	16.3	B	<5x*B	16.3	8.15	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0778	0.3112	0.828	B	<5x*B	0.828	0.414	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	1.57	6.28	701	CJ		701	350.5	0.0001	0.1	0.0	0.1%	0.1%	
PCB-114	1.56	6.24	33.3	--		33.3	33.3	0.0005	0.0	0.0	0.0%	0.0%	
PCB-118	1.33	5.32	1410	CJ		1410	705	0.0001	0.1	0.1	0.2%	0.1%	
PCB-123	1.49	5.96	--			0.745		0.0001	0.0		0.0%	0.0%	
PCB-126	0.458	1.832	3.18	--		3.18	3.18	0.1	0.3	0.3	0.5%	0.5%	
PCB-156	0.391	1.564	203	--		203	203	0.0005	0.1	0.1	0.2%	0.2%	
PCB-157	0.412	1.648	47.1	--		47.1	47.1	0.0005	0.0	0.0	0.0%	0.0%	
PCB-167	0.379	1.516	73.6	--		73.6	73.6	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	1.05	4.2	E			0.525		0.01	0.0		0.0%	0.0%	
PCB-189	0.354	1.416	9.59	--		9.59	9.59	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
67.2	67.0	0.7	0.6	67.9	67.6

APPENDIX A2. Quality Control Results

FINAL

Sample ID	PC00268	PE Low Std	PEL										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0367	0.1468	2.86	NJ		1.43		0.1	0.1		0.3%	0.0%	
2,3,7,8-TCDD	0.0163	0.0652	8.14	--		8.14	8.14	1	8.1	8.1	16.2%	16.3%	
1,2,3,7,8-PeCDF	0.0831	0.3324	73	--		73	73	0.05	3.7	3.7	7.3%	7.3%	
2,3,4,7,8-PeCDF	0.038	0.152	18.9	--		18.9	18.9	0.5	9.5	9.5	18.8%	19.0%	
1,2,3,7,8-PeCDD	0.0239	0.0956	13.5	--		13.5	13.5	1	13.5	13.5	26.8%	27.1%	
1,2,3,4,7,8-HxCDF	0.0517	0.2068	19.4	--		19.4	19.4	0.1	1.9	1.9	3.9%	3.9%	
1,2,3,6,7,8-HxCDF	0.0581	0.2324	1.45	--		1.45	1.45	0.1	0.1	0.1	0.3%	0.3%	
2,3,4,6,7,8-HxCDF	0.0769	0.3076	50.7	--		50.7	50.7	0.1	5.1	5.1	10.1%	10.2%	
1,2,3,7,8,9-HxCDF	0.0969	0.3876	49.1	--		49.1	49.1	0.1	4.9	4.9	9.8%	9.9%	
1,2,3,4,7,8-HxCDD	0.0233	0.0932	6.02	--		6.02	6.02	0.1	0.6	0.6	1.2%	1.2%	
1,2,3,6,7,8-HxCDD	0.0189	0.0756	10	--		10	10	0.1	1.0	1.0	2.0%	2.0%	
1,2,3,7,8,9-HxCDD	0.0216	0.0864	1.57	J		1.57	0.785	0.1	0.2	0.1	0.3%	0.2%	
1,2,3,4,6,7,8-HpCDF	0.0461	0.1844	4.08	--		4.08	4.08	0.01	0.0	0.0	0.1%	0.1%	
1,2,3,4,7,8,9-HpCDF	0.0612	0.2448	38.4	--		38.4	38.4	0.01	0.4	0.4	0.8%	0.8%	
1,2,3,4,6,7,8-HpCDD	0.0743	0.2972	57	--		57	57	0.01	0.6	0.6	1.1%	1.1%	
OCDF	0.029	0.116	18.6	J		18.6	9.3	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0391	0.1564	230	--		230	230	0.0001	0.0	0.0	0.1%	0.1%	
PCB-77	0.103	0.412	16.6	B	<5x*B	16.6	8.3	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.0973	0.3892	1.02	B	<5x*B	1.02	0.51	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	0.355	1.42	612	CJ		612	306	0.0001	0.1	0.0	0.1%	0.1%	
PCB-114	0.371	1.484	29.5	--		29.5	29.5	0.0005	0.0	0.0	0.0%	0.0%	
PCB-118	0.422	1.688	1220	CJ		1220	610	0.0001	0.1	0.1	0.2%	0.1%	
PCB-123	0.479	1.916	18.2	--		18.2	18.2	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	0.279	1.116	2.81	J		2.81	1.405	0.1	0.3	0.1	0.6%	0.3%	
PCB-156	0.46	1.84	166	--		166	166	0.0005	0.1	0.1	0.2%	0.2%	
PCB-157	0.476	1.904	31.4	--		31.4	31.4	0.0005	0.0	0.0	0.0%	0.0%	
PCB-167	0.468	1.872	57.7	--		57.7	57.7	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	0.901	3.604	E		0.4505			0.01	0.0		0.0%	0.0%	
PCB-189	0.176	0.704	6.46	--		6.46	6.46	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
49.7	49.5	0.6	0.3	50.3	49.9

APPENDIX A2. Quality Control Results

FINAL

Sample ID	PC00359	PE Low Std	PEL									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0436	0.1744	2.14	NJ		1.07		0.1	0.1		0.2%	0.0%
2,3,7,8-TCDD	0.0214	0.0856	7.5	--		7.5	7.5	1	7.5	7.5	16.4%	16.5%
1,2,3,7,8-PeCDF	0.00537	0.0215	64.9	--		64.9	64.9	0.05	3.2	3.2	7.1%	7.1%
2,3,4,7,8-PeCDF	0.0041	0.0164	17.9	--		17.9	17.9	0.5	9.0	9.0	19.6%	19.7%
1,2,3,7,8-PeCDD	0.00127	0.0051	11.9	--		11.9	11.9	1	11.9	11.9	26.1%	26.2%
1,2,3,4,7,8-HxCDF	0.0726	0.2904	19.2	--		19.2	19.2	0.1	1.9	1.9	4.2%	4.2%
1,2,3,6,7,8-HxCDF	0.0659	0.2636	0.926	--		0.926	0.926	0.1	0.1	0.1	0.2%	0.2%
2,3,4,6,7,8-HxCDF	0.0982	0.3928	45.1	--		45.1	45.1	0.1	4.5	4.5	9.9%	9.9%
1,2,3,7,8,9-HxCDF	0.161	0.644	42.9	--		42.9	42.9	0.1	4.3	4.3	9.4%	9.4%
1,2,3,4,7,8-HxCDD	0.0371	0.1484	5.61	--		5.61	5.61	0.1	0.6	0.6	1.2%	1.2%
1,2,3,6,7,8-HxCDD	0.0328	0.1312	9.47	--		9.47	9.47	0.1	0.9	0.9	2.1%	2.1%
1,2,3,7,8,9-HxCDD	0.036	0.144	1.31	--		1.31	1.31	0.1	0.1	0.1	0.3%	0.3%
1,2,3,4,6,7,8-HpCDF	8.04	32.16	D	<5x*B		2.01		0.01	0.0		0.0%	0.0%
1,2,3,4,7,8,9-HpCDF	0.192	0.768	41.9	--		41.9	41.9	0.01	0.4	0.4	0.9%	0.9%
1,2,3,4,6,7,8-HpCDD	0.104	0.416	56.5	--		56.5	56.5	0.01	0.6	0.6	1.2%	1.2%
OCDF	0.143	0.572	24.9	--		24.9	24.9	0.0001	0.0	0.0	0.0%	0.0%
OCDD	0.199	0.796	228	--		228	228	0.0001	0.0	0.0	0.1%	0.1%
PCB-77	0.103	0.412	12.6	B	<5x*B	12.6	6.3	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.105	0.42	0.734	B	<5x*B	0.734	0.367	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	3.99	15.96	486	--		486	486	0.0001	0.0	0.0	0.1%	0.1%
PCB-114	3.97	15.88	25.2	--		25.2	25.2	0.0005	0.0	0.0	0.0%	0.0%
PCB-118	3.54	14.16	967	CJ		967	483.5	0.0001	0.1	0.0	0.2%	0.1%
PCB-123	3.98	15.92	--			1.99		0.0001	0.0		0.0%	0.0%
PCB-126	0.503	2.012	2.42	--		2.42	2.42	0.1	0.2	0.2	0.5%	0.5%
PCB-156	0.355	1.42	134	--		134	134	0.0005	0.1	0.1	0.2%	0.2%
PCB-157	0.374	1.496	33	--		33	33	0.0005	0.0	0.0	0.0%	0.0%
PCB-167	0.345	1.38	46.8	--		46.8	46.8	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.654	2.616	E			0.327		0.01	0.0		0.0%	0.0%
PCB-189	0.455	1.82	5.83	--		5.83	5.83	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
45.2	45.1	0.5	0.4	45.7	45.5

APPENDIX A2. Quality Control Results

FINAL

Sample ID	201	PE	Med	Std	PEM-F-10										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ				
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant			
2,3,7,8-TCDF	0.0361	0.1444	6.22	NJ		3.11		0.1	0.3		0.2%	0.0%			
2,3,7,8-TCDD	0.0204	0.0816	53.5	--		53.5	53.5	1	53.5	53.5	41.5%	42.5%			
1,2,3,7,8-PeCDF	0.0173	0.0692	37.9	--		37.9	37.9	0.05	1.9	1.9	1.5%	1.5%			
2,3,4,7,8-PeCDF	0.971	3.884		E		0.4855		0.5	0.2		0.2%	0.0%			
1,2,3,7,8-PeCDD	0.00541	0.0216	42.2	--		42.2	42.2	1	42.2	42.2	32.7%	33.5%			
1,2,3,4,7,8-HxCDF	0.0333	0.1332	39.6	--		39.6	39.6	0.1	4.0	4.0	3.1%	3.1%			
1,2,3,6,7,8-HxCDF	0.0293	0.1172	1.64	--		1.64	1.64	0.1	0.2	0.2	0.1%	0.1%			
2,3,4,6,7,8-HxCDF	0.0344	0.1376	31.1	--		31.1	31.1	0.1	3.1	3.1	2.4%	2.5%			
1,2,3,7,8,9-HxCDF	0.0433	0.1732	8.31	--		8.31	8.31	0.1	0.8	0.8	0.6%	0.7%			
1,2,3,4,7,8-HxCDD	0.0361	0.1444	35.7	--		35.7	35.7	0.1	3.6	3.6	2.8%	2.8%			
1,2,3,6,7,8-HxCDD	0.0327	0.1308	2.88	--		2.88	2.88	0.1	0.3	0.3	0.2%	0.2%			
1,2,3,7,8,9-HxCDD	0.0355	0.142	65.7	--		65.7	65.7	0.1	6.6	6.6	5.1%	5.2%			
1,2,3,4,6,7,8-HpCDF	0.0497	0.1988	49.9	--		49.9	49.9	0.01	0.5	0.5	0.4%	0.4%			
1,2,3,4,7,8,9-HpCDF	0.0771	0.3084	26.4	--		26.4	26.4	0.01	0.3	0.3	0.2%	0.2%			
1,2,3,4,6,7,8-HpCDD	0.0532	0.2128	48.4	--		48.4	48.4	0.01	0.5	0.5	0.4%	0.4%			
OCDF	0.0506	0.2024	146	--		146	146	0.0001	0.0	0.0	0.0%	0.0%			
OCDD	0.0505	0.202	443	--		443	443	0.0001	0.0	0.0	0.0%	0.0%			
PCB-77	0.865	3.46	199	--		199	199	0.0001	0.0	0.0	0.0%	0.0%			
PCB-81	0.882	3.528	8.17	--		8.17	8.17	0.0001	0.0	0.0	0.0%	0.0%			
PCB-105	14.6	58.4	10800	CJ		10800	5400	0.0001	1.1	0.5	0.8%	0.4%			
PCB-114	14.5	58	698	CJ		698	349	0.0005	0.3	0.2	0.3%	0.1%			
PCB-118	13	52	19700	SJ		19700	9850	0.0001	2.0	1.0	1.5%	0.8%			
PCB-123	14.6	58.4		--		7.3		0.0001	0.0		0.0%	0.0%			
PCB-126	8.18	32.72	58.7	--		58.7	58.7	0.1	5.9	5.9	4.5%	4.7%			
PCB-156	2.78	11.12	2820	CJ		2820	1410	0.0005	1.4	0.7	1.1%	0.6%			
PCB-157	2.92	11.68	649	CJ		649	324.5	0.0005	0.3	0.2	0.3%	0.1%			
PCB-167	2.7	10.8	1080	CJ		1080	540	0.00001	0.0	0.0	0.0%	0.0%			
PCB-169	7.79	31.16		E		3.895		0.01	0.0		0.0%	0.0%			
PCB-189	1.11	4.44	113	--		113	113	0.0001	0.0	0.0	0.0%	0.0%			

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
117.9	117.4	11.1	8.5	129.0	125.9

APPENDIX A2. Quality Control Results

FINAL

Sample ID	351	PE Med Std	PEM-F-12										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEO		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0316	0.1264	6.72	NJ		3.36		0.1	0.3		0.2%	0.0%	
2,3,7,8-TCDD	0.0212	0.0848	58.9	--		58.9	58.9	1	58.9	58.9	42.7%	44.7%	
1,2,3,7,8-PeCDF	0.0258	0.1032	44.6	--		44.6	44.6	0.05	2.2	2.2	1.6%	1.7%	
2,3,4,7,8-PeCDF	0.0202	0.0808	1.05	--		1.05	1.05	0.5	0.5	0.5	0.4%	0.4%	
1,2,3,7,8-PeCDD	0.00315	0.0126	43.7	--		43.7	43.7	1	43.7	43.7	31.7%	33.1%	
1,2,3,4,7,8-HxCDF	0.0771	0.3084	44	--		44	44	0.1	4.4	4.4	3.2%	3.3%	
1,2,3,6,7,8-HxCDF	0.0687	0.2748	1.84	B	<5x*B	1.84	0.92	0.1	0.2	0.1	0.1%	0.1%	
2,3,4,6,7,8-HxCDF	0.0882	0.3528	35.1	--		35.1	35.1	0.1	3.5	3.5	2.5%	2.7%	
1,2,3,7,8,9-HxCDF	0.121	0.484	9.08	--		9.08	9.08	0.1	0.9	0.9	0.7%	0.7%	
1,2,3,4,7,8-HxCDD	0.0265	0.106	38.1	--		38.1	38.1	0.1	3.8	3.8	2.8%	2.9%	
1,2,3,6,7,8-HxCDD	0.0235	0.094	3.28	--		3.28	3.28	0.1	0.3	0.3	0.2%	0.2%	
1,2,3,7,8,9-HxCDD	0.026	0.104	57.1	J		57.1	28.55	0.1	5.7	2.9	4.1%	2.2%	
1,2,3,4,6,7,8-HpCDF	0.0834	0.3336	50.2	--		50.2	50.2	0.01	0.5	0.5	0.4%	0.4%	
1,2,3,4,7,8,9-HpCDF	0.157	0.628	31.2	--		31.2	31.2	0.01	0.3	0.3	0.2%	0.2%	
1,2,3,4,6,7,8-HpCDD	0.096	0.384	57.1	--		57.1	57.1	0.01	0.6	0.6	0.4%	0.4%	
OCDF	0.0519	0.2076	174	--		174	174	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.049	0.196	492	--		492	492	0.0001	0.0	0.0	0.0%	0.0%	
PCB-77	0.0851	0.3404	210	--		210	210	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.116	0.464	8.66	--		8.66	8.66	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	53.9	215.6	11600	CJ		11600	5800	0.0001	1.2	0.6	0.8%	0.4%	
PCB-114	56.4	225.6	692	CJ		692	346	0.0005	0.3	0.2	0.3%	0.1%	
PCB-118	63.5	254	19000	SJ		19000	9500	0.0001	1.9	1.0	1.4%	0.7%	
PCB-123	72.2	288.8	451	J		451	225.5	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	4.31	17.24	65.2	--		65.2	65.2	0.1	6.5	6.5	4.7%	4.9%	
PCB-156	1.13	4.52	2990	CJ		2990	1495	0.0005	1.5	0.7	1.1%	0.6%	
PCB-157	1.17	4.68	687	CJ		687	343.5	0.0005	0.3	0.2	0.2%	0.1%	
PCB-167	1.15	4.6	1140	CJ		1140	570	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	10.1	40.4	E			5.05		0.01	0.1		0.0%	0.0%	
PCB-189	0.279	1.116	126	--		126	126	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
126.0	122.7	11.9	9.2	137.9	131.9

APPENDIX A2. Quality Control Results

FINAL

Sample ID	688	PE Med Std	PEM-F-11									
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0199	0.0796	6.24	NJ		3.12		0.1	0.3		0.3%	0.0%
2,3,7,8-TCDD	0.00962	0.0385	51.4	--		51.4	51.4	1	51.4	51.4	40.9%	42.8%
1,2,3,7,8-PeCDF	0.00192	0.0077	41.4	--		41.4	41.4	0.05	2.1	2.1	1.7%	1.7%
2,3,4,7,8-PeCDF	0.00144	0.0058	0.955	--		0.955	0.955	0.5	0.5	0.5	0.4%	0.4%
1,2,3,7,8-PeCDD	0.00154	0.0062	40.2	--		40.2	40.2	1	40.2	40.2	32.0%	33.4%
1,2,3,4,7,8-HxCDF	0.0487	0.1948	40.4	--		40.4	40.4	0.1	4.0	4.0	3.2%	3.4%
1,2,3,6,7,8-HxCDF	0.0429	0.1716	1.63	--		1.63	1.63	0.1	0.2	0.2	0.1%	0.1%
2,3,4,6,7,8-HxCDF	0.0513	0.2052	30.2	--		30.2	30.2	0.1	3.0	3.0	2.4%	2.5%
1,2,3,7,8,9-HxCDF	0.0509	0.2036	8.74	--		8.74	8.74	0.1	0.9	0.9	0.7%	0.7%
1,2,3,4,7,8-HxCDD	0.0173	0.0692	38.8	--		38.8	38.8	0.1	3.9	3.9	3.1%	3.2%
1,2,3,6,7,8-HxCDD	0.0171	0.0684	3.02	--		3.02	3.02	0.1	0.3	0.3	0.2%	0.3%
1,2,3,7,8,9-HxCDD	0.0179	0.0716	73.7	--		73.7	73.7	0.1	7.4	7.4	5.9%	6.1%
1,2,3,4,6,7,8-HpCDF	0.0649	0.2596	49.8	--		49.8	49.8	0.01	0.5	0.5	0.4%	0.4%
1,2,3,4,7,8,9-HpCDF	0.0783	0.3132	29.3	--		29.3	29.3	0.01	0.3	0.3	0.2%	0.2%
1,2,3,4,6,7,8-HpCDD	0.0488	0.1952	49.7	--		49.7	49.7	0.01	0.5	0.5	0.4%	0.4%
OCDF	0.0186	0.0744	142	--		142	142	0.0001	0.0	0.0	0.0%	0.0%
OCDD	0.0178	0.0712	449	--		449	449	0.0001	0.0	0.0	0.0%	0.0%
PCB-77	0.181	0.724	202	--		202	202	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.206	0.824	8.07	--		8.07	8.07	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	112	448	9070	SJ		9070	4535	0.0001	0.9	0.5	0.7%	0.4%
PCB-114	112	448	606	CJ		606	303	0.0005	0.3	0.2	0.2%	0.1%
PCB-118	106	424	11100	SJ		11100	5550	0.0001	1.1	0.6	0.9%	0.5%
PCB-123	119	476	516	CJ		516	258	0.0001	0.1	0.0	0.0%	0.0%
PCB-126	0.369	1.476	60.1	J		60.1	30.05	0.1	6.0	3.0	4.8%	2.5%
PCB-156	1.05	4.2	2800	CJ		2800	1400	0.0005	1.4	0.7	1.1%	0.6%
PCB-157	1.11	4.44	630	CJ		630	315	0.0005	0.3	0.2	0.3%	0.1%
PCB-167	1.02	4.08	924	CJ		924	462	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	9.63	38.52		E		4.815		0.01	0.0		0.0%	0.0%
PCB-189	0.2	0.8	115	--		115	115	0.0001	0.0	0.0	0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
115.5	115.1	10.2	5.1	125.6	120.2

APPENDIX A2. Quality Control Results

FINAL

Sample ID	PC00807	PE Med Std	PEM										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0199	0.0796	4.04	NJ		2.02		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.0103	0.0412	32.5	--		32.5	32.5	1	32.5	32.5	40.0%	40.9%	
1,2,3,7,8-PeCDF	0.0204	0.0816	25	--		25	25	0.05	1.3	1.3	1.5%	1.6%	
2,3,4,7,8-PeCDF	0.0164	0.0656	0.597	--		0.597	0.597	0.5	0.3	0.3	0.4%	0.4%	
1,2,3,7,8-PeCDD	0.00791	0.0316	27.3	--		27.3	27.3	1	27.3	27.3	33.6%	34.4%	
1,2,3,4,7,8-HxCDF	0.0382	0.1528	25.4	--		25.4	25.4	0.1	2.5	2.5	3.1%	3.2%	
1,2,3,6,7,8-HxCDF	0.0334	0.1336	1.09	--		1.09	1.09	0.1	0.1	0.1	0.1%	0.1%	
2,3,4,6,7,8-HxCDF	0.0473	0.1892	20	--		20	20	0.1	2.0	2.0	2.5%	2.5%	
1,2,3,7,8,9-HxCDF	0.0707	0.2828	5.19	--		5.19	5.19	0.1	0.5	0.5	0.6%	0.7%	
1,2,3,4,7,8-HxCDD	0.0205	0.082	23.3	--		23.3	23.3	0.1	2.3	2.3	2.9%	2.9%	
1,2,3,6,7,8-HxCDD	0.0185	0.074	1.89	--		1.89	1.89	0.1	0.2	0.2	0.2%	0.2%	
1,2,3,7,8,9-HxCDD	0.02	0.08	33.8	--		33.8	33.8	0.1	3.4	3.4	4.2%	4.3%	
1,2,3,4,6,7,8-HpCDF	0.126	0.504	31.7	--		31.7	31.7	0.01	0.3	0.3	0.4%	0.4%	
1,2,3,4,7,8,9-HpCDF	0.225	0.9	18	--		18	18	0.01	0.2	0.2	0.2%	0.2%	
1,2,3,4,6,7,8-HpCDD	0.0316	0.1264	27	--		27	27	0.01	0.3	0.3	0.3%	0.3%	
OCDF	0.0904	0.3616	102	--		102	102	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0497	0.1988	199	--		199	199	0.0001	0.0	0.0	0.0%	0.0%	
PCB-77	0.424	1.696	148	--		148	148	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.427	1.708	6.1	--		6.1	6.1	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	23.1	92.4	7410	CJ		7410	3705	0.0001	0.7	0.4	0.9%	0.5%	
PCB-114	23	92	428	--		428	428	0.0005	0.2	0.2	0.3%	0.3%	
PCB-118	20.9	83.6	14700	SJ		14700	7350	0.0001	1.5	0.7	1.8%	0.9%	
PCB-123	23.5	94	--			11.75		0.0001	0.0		0.0%	0.0%	
PCB-126	6.24	24.96	42.2	--		42.2	42.2	0.1	4.2	4.2	5.2%	5.3%	
PCB-156	0.961	3.844	1940	CJ		1940	970	0.0005	1.0	0.5	1.2%	0.6%	
PCB-157	1.01	4.04	436	--		436	436	0.0005	0.2	0.2	0.3%	0.3%	
PCB-167	0.934	3.736	756	CJ		756	378	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	5.21	20.84	E			2.605		0.01	0.0		0.0%	0.0%	
PCB-189	0.731	2,924	71.6	--		71.6	71.6	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
73.4	73.2	7.9	6.3	81.3	79.5

APPENDIX A2. Quality Control Results

FINAL

Sample ID	PC00820	PE Med Std	PEM										
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0678	0.2712	4.59	NJ		2.295		0.1	0.2		0.3%	0.0%	
2,3,7,8-TCDD	0.0267	0.1068	31.5	--		31.5	31.5	1	31.5	31.5	37.1%	40.2%	
1,2,3,7,8-PeCDF	0.0594	0.2376	25.8	--		25.8	25.8	0.05	1.3	1.3	1.5%	1.7%	
2,3,4,7,8-PeCDF	0.0401	0.1604	0.749	--		0.749	0.749	0.5	0.4	0.4	0.4%	0.5%	
1,2,3,7,8-PeCDD	0.061	0.244	29.8	I		29.8	29.8	1	29.8	29.8	35.1%	38.0%	
1,2,3,4,7,8-HxCDF	0.0612	0.2448	25.9	--		25.9	25.9	0.1	2.6	2.6	3.1%	3.3%	
1,2,3,6,7,8-HxCDF	0.0469	0.1876	1.62	--		1.62	1.62	0.1	0.2	0.2	0.2%	0.2%	
2,3,4,6,7,8-HxCDF	0.0622	0.2488	22.3	--		22.3	22.3	0.1	2.2	2.2	2.6%	2.8%	
1,2,3,7,8,9-HxCDF	0.0961	0.3844	5.59	--		5.59	5.59	0.1	0.6	0.6	0.7%	0.7%	
1,2,3,4,7,8-HxCDD	0.0616	0.2464	21.1	--		21.1	21.1	0.1	2.1	2.1	2.5%	2.7%	
1,2,3,6,7,8-HxCDD	0.0447	0.1788	2.05	--		2.05	2.05	0.1	0.2	0.2	0.2%	0.3%	
1,2,3,7,8,9-HxCDD	0.0537	0.2148	43.8	J		43.8	21.9	0.1	4.4	2.2	5.2%	2.8%	
1,2,3,4,6,7,8-HpCDF	0.0311	0.1244	28.8	--		28.8	28.8	0.01	0.3	0.3	0.3%	0.4%	
1,2,3,4,7,8,9-HpCDF	0.0734	0.2936	14.8	--		14.8	14.8	0.01	0.1	0.1	0.2%	0.2%	
1,2,3,4,6,7,8-HpCDD	0.0861	0.3444	24	--		24	24	0.01	0.2	0.2	0.3%	0.3%	
OCDF	0.0403	0.1612	29.5	J		29.5	14.75	0.0001	0.0	0.0	0.0%	0.0%	
OCDD	0.0559	0.2236	178	--		178	178	0.0001	0.0	0.0	0.0%	0.0%	
PCB-77	0.0968	0.3872	166	--		166	166	0.0001	0.0	0.0	0.0%	0.0%	
PCB-81	0.108	0.432	6.77	--		6.77	6.77	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105	16.4	65.6	7990	CJ		7990	3995	0.0001	0.8	0.4	0.9%	0.5%	
PCB-114	17.2	68.8	469	--		469	469	0.0005	0.2	0.2	0.3%	0.3%	
PCB-118	19.5	78	16000	SJ		16000	8000	0.0001	1.6	0.8	1.9%	1.0%	
PCB-123	22.2	88.8	268	--		268	268	0.0001	0.0	0.0	0.0%	0.0%	
PCB-126	1.9	7.6	49.5	J		49.5	24.75	0.1	5.0	2.5	5.8%	3.2%	
PCB-156	2.26	9.04	2000	CJ		2000	1000	0.0005	1.0	0.5	1.2%	0.6%	
PCB-157	2.34	9.36	453	--		453	453	0.0005	0.2	0.2	0.3%	0.3%	
PCB-167	2.3	9.2	751	CJ		751	375.5	0.00001	0.0	0.0	0.0%	0.0%	
PCB-169	6.29	25.16		E		3.145		0.01	0.0		0.0%	0.0%	
PCB-189	0.221	0.884	71.8	--		71.8	71.8	0.0001	0.0	0.0	0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
76.1	73.7	8.9	4.7	85.0	78.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	333	Split		S1								
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ	
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant
2,3,7,8-TCDF	0.0438	0.1752	1.52	NJ		0.76		0.1	0.1		1.0%	0.0%
2,3,7,8-TCDD	0.0336	0.1344		--		0.0168		1	0.0		0.2%	0.0%
1,2,3,7,8-PeCDF	0.0326	0.1304	11.3	--		11.3	11.3	0.05	0.6	0.6	7.4%	7.6%
2,3,4,7,8-PeCDF	0.0252	0.1008	1.92	--		1.92	1.92	0.5	1.0	1.0	12.6%	13.0%
1,2,3,7,8-PeCDD	0.0244	0.0976	0.497	--		0.497	0.497	1	0.5	0.5	6.5%	6.7%
1,2,3,4,7,8-HxCDF	0.024	0.096	19.1	--		19.1	19.1	0.1	1.9	1.9	25.1%	25.8%
1,2,3,6,7,8-HxCDF	0.0207	0.0828	8.84	--		8.84	8.84	0.1	0.9	0.9	11.6%	12.0%
2,3,4,6,7,8-HxCDF	0.0227	0.0908	4.21	--		4.21	4.21	0.1	0.4	0.4	5.5%	5.7%
1,2,3,7,8,9-HxCDF	0.0254	0.1016	4.77	--		4.77	4.77	0.1	0.5	0.5	6.3%	6.5%
1,2,3,4,7,8-HxCDD	0.66	2.64		E	<5x*B	0.33		0.1	0.0		0.4%	0.0%
1,2,3,6,7,8-HxCDD	0.0544	0.2176	1.05	--		1.05	1.05	0.1	0.1	0.1	1.4%	1.4%
1,2,3,7,8,9-HxCDD	1.21	4.84		E		0.605		0.1	0.1		0.8%	0.0%
1,2,3,4,6,7,8-HpCDF	0.032	0.128	49.7	--		49.7	49.7	0.01	0.5	0.5	6.5%	6.7%
1,2,3,4,7,8,9-HpCDF	0.0406	0.1624	21.4	--		21.4	21.4	0.01	0.2	0.2	2.8%	2.9%
1,2,3,4,6,7,8-HpCDD	0.086	0.344	15.9	--		15.9	15.9	0.01	0.2	0.2	2.1%	2.2%
OCDF	0.014	0.056	333	--		333	333	0.0001	0.0	0.0	0.4%	0.5%
OCDD	0.0341	0.1364	127	--		127	127	0.0001	0.0	0.0	0.2%	0.2%
PCB-77	0.133	0.532	23.8	--		23.8	23.8	0.0001	0.0	0.0	0.0%	0.0%
PCB-81	0.13	0.52	1.41	B	<5x*B	1.41	0.705	0.0001	0.0	0.0	0.0%	0.0%
PCB-105	0.569	2.276	290	--		290	290	0.0001	0.0	0.0	0.4%	0.4%
PCB-114	0.565	2.26	18.3	--		18.3	18.3	0.0005	0.0	0.0	0.1%	0.1%
PCB-118	0.417	1.668	629	CJ		629	314.5	0.0001	0.1	0.0	0.8%	0.4%
PCB-123	0.469	1.876		--	0.2345			0.0001	0.0		0.0%	0.0%
PCB-126	0.393	1.572	5.09	--		5.09	5.09	0.1	0.5	0.5	6.7%	6.9%
PCB-156	0.54	2.16	104	--		104	104	0.0005	0.1	0.1	0.7%	0.7%
PCB-157	0.569	2.276	26.3	--		26.3	26.3	0.0005	0.0	0.0	0.2%	0.2%
PCB-167	0.524	2.096	46.2	--		46.2	46.2	0.00001	0.0	0.0	0.0%	0.0%
PCB-169	0.0474	0.1896	1.03	--		1.03	1.03	0.01	0.0	0.0	0.1%	0.1%
PCB-189	12.8	51.2		E		6.4		0.0001	0.0		0.0%	0.0%

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
6.9	6.7	0.7	0.7	7.6	7.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	743	Split		S5		Several analytes not reported							
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ		
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant	
2,3,7,8-TCDF	0.0624	0.2496	0.337	NJ		0.1685		0.1	0.0		1.3%	0.0%	
2,3,7,8-TCDD	1.15	4.6		E		0.575		1	0.6		43.0%	0.0%	
1,2,3,7,8-PeCDF	0.644	2.576		E		0.322		0.05	0.0		1.2%	0.0%	
2,3,4,7,8-PeCDF	0.36	1.44		E		0.18		0.5	0.1		6.7%	0.0%	
1,2,3,7,8-PeCDD	0.0527	0.2108		--		0.02635		1	0.0		2.0%	0.0%	
1,2,3,4,7,8-HxCDF	1.07	4.28		E		0.535		0.1	0.1		4.0%	0.0%	
1,2,3,6,7,8-HxCDF	0.0337	0.1348	0.566	B	<5x*B	0.566	0.283	0.1	0.1	0.0	4.2%	6.4%	
2,3,4,6,7,8-HxCDF	0.528	2.112		E		0.264		0.1	0.0		2.0%	0.0%	
1,2,3,7,8,9-HxCDF	0.0562	0.2248	0.472	--		0.472	0.472	0.1	0.0	0.0	3.5%	10.8%	
1,2,3,4,7,8-HxCDD	0.309	1.236		E		0.1545		0.1	0.0		1.2%	0.0%	
1,2,3,6,7,8-HxCDD	0.0142	0.0568	0.424	--		0.424	0.424	0.1	0.0	0.0	3.2%	9.7%	
1,2,3,7,8,9-HxCDD	0.24	0.96		EJ		0.12		0.1	0.0		0.9%	0.0%	
1,2,3,4,6,7,8-HpCDF	0.031	0.124	3.99	--		3.99	3.99	0.01	0.0	0.0	3.0%	9.1%	
1,2,3,4,7,8,9-HpCDF	0.0533	0.2132	1.28	--		1.28	1.28	0.01	0.0	0.0	1.0%	2.9%	
1,2,3,4,6,7,8-HpCDD	7.71	30.84		E		3.855		0.01	0.0		2.9%	0.0%	
OCDF	0.0478	0.1912	21.6	--		21.6	21.6	0.0001	0.0	0.0	0.2%	0.5%	
OCDD	0.055	0.22	63.8	--		63.8	63.8	0.0001	0.0	0.0	0.5%	1.5%	
PCB-77	0.0613	0.2452	7.62	B	<5x*B	7.62	3.81	0.0001	0.0	0.0	0.1%	0.1%	
PCB-81	0.0796	0.3184	1.2	B	<5x*B	1.2	0.6	0.0001	0.0	0.0	0.0%	0.0%	
PCB-105				--	<5x*B			0.0001			0.0%	0.0%	
PCB-114				--	<5x*B			0.0005			0.0%	0.0%	
PCB-118				--	<5x*B			0.0001			0.0%	0.0%	
PCB-123				--	<5x*B			0.0001			0.0%	0.0%	
PCB-126	0.252	1.008	2.51	--		2.51	2.51	0.1	0.3	0.3	18.8%	57.1%	
PCB-156				--	<5x*B			0.0005			0.0%	0.0%	
PCB-157				--	<5x*B			0.0005			0.0%	0.0%	
PCB-167				--	<5x*B			0.00001			0.0%	0.0%	
PCB-169	0.0865	0.346	0.867	--		0.867	0.867	0.01	0.0	0.0	0.7%	2.0%	
PCB-189				--				0.0001			0.0%	0.0%	

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
1.1	0.2	0.3	0.3	1.3	0.4

APPENDIX A2. Quality Control Results

FINAL

Sample ID	874	Split		S35												
Analyte	Analytical Limits		Results		<5x in MB found	Adjusted Concentrations*		WHO TEFs Human	Calculated TEQs (ppt)		Percent of Total TEQ					
	EDL	QL	Conc	Flag		Full	Quant		Full	Quant	Full	Quant				
2,3,7,8-TCDF	0.904	3.616		E		0.452		0.1	0.0		1.0%	0.0%				
2,3,7,8-TCDD	0.029	0.116	0.117	--		0.117	0.117	1	0.1	0.1	2.6%	2.9%				
1,2,3,7,8-PeCDF	0.0132	0.0528	4.37	--		4.37	4.37	0.05	0.2	0.2	4.9%	5.5%				
2,3,4,7,8-PeCDF	0.00997	0.0399	0.986	--		0.986	0.986	0.5	0.5	0.5	11.1%	12.3%				
1,2,3,7,8-PeCDD	0.431	1.724		E		0.2155		1	0.2		4.8%	0.0%				
1,2,3,4,7,8-HxCDF	0.0195	0.078	7.28	--		7.28	7.28	0.1	0.7	0.7	16.3%	18.2%				
1,2,3,6,7,8-HxCDF	0.0171	0.0684	3.77	--		3.77	3.77	0.1	0.4	0.4	8.5%	9.4%				
2,3,4,6,7,8-HxCDF	0.0198	0.0792	1.92	--		1.92	1.92	0.1	0.2	0.2	4.3%	4.8%				
1,2,3,7,8,9-HxCDF	0.023	0.092	1.7	B	<5x*B	1.7	0.85	0.1	0.2	0.1	3.8%	2.1%				
1,2,3,4,7,8-HxCDD	0.0397	0.1588	0.437	B	<5x*B	0.437	0.2185	0.1	0.0	0.0	1.0%	0.6%				
1,2,3,6,7,8-HxCDD	0.681	2.724		E		0.3405		0.1	0.0		0.8%	0.0%				
1,2,3,7,8,9-HxCDD	0.694	2.776		E		0.347		0.1	0.0		0.8%	0.0%				
1,2,3,4,6,7,8-HpCDF	0.0207	0.0828	19.8	--		19.8	19.8	0.01	0.2	0.2	4.4%	5.0%				
1,2,3,4,7,8,9-HpCDF	0.0293	0.1172	7.91	--		7.91	7.91	0.01	0.1	0.1	1.8%	2.0%				
1,2,3,4,6,7,8-HpCDD	0.0531	0.2124	15.2	--		15.2	15.2	0.01	0.2	0.2	3.4%	3.8%				
OCDF	0.0128	0.0512	104	--		104	104	0.0001	0.0	0.0	0.2%	0.3%				
OCDD	0.028	0.112	119	--		119	119	0.0001	0.0	0.0	0.3%	0.3%				
PCB-77	0.0571	0.2284	66.4	--		66.4	66.4	0.0001	0.0	0.0	0.2%	0.2%				
PCB-81	0.0558	0.2232	2.48	B	<5x*B	2.48	1.24	0.0001	0.0	0.0	0.0%	0.0%				
PCB-105	1.97	7.88	338	--		338	338	0.0001	0.0	0.0	0.8%	0.9%				
PCB-114	1.96	7.84	15.5	--		15.5	15.5	0.0005	0.0	0.0	0.2%	0.2%				
PCB-118	1.65	6.6	623	CJ		623	311.5	0.0001	0.1	0.0	1.4%	0.8%				
PCB-123	1.86	7.44		--		0.93		0.0001	0.0		0.0%	0.0%				
PCB-126	0.573	2.292	11.5	--		11.5	11.5	0.1	1.2	1.2	25.8%	28.8%				
PCB-156	0.496	1.984	108	--		108	108	0.0005	0.1	0.1	1.2%	1.4%				
PCB-157	0.522	2.088	27.3	--		27.3	27.3	0.0005	0.0	0.0	0.3%	0.3%				
PCB-167	0.481	1.924	48.3	--		48.3	48.3	0.00001	0.0	0.0	0.0%	0.0%				
PCB-169	0.0853	0.3412	1.18	--		1.18	1.18	0.01	0.0	0.0	0.3%	0.3%				
PCB-189	0.526	2.104	12.2	--		12.2	12.2	0.0001	0.0	0.0	0.0%	0.0%				

* Adjusted concentrations were modified using validation flags.

The Dioxin/Furan Only Full TEQ is used in this report. --->

Dioxin/Furan Only		PCBs Only		All Analytes	
Full	Quant	Full	Quant	Full	Quant
3.1	2.7	1.3	1.3	4.5	4.0

APPENDIX B
GRAPHICAL DATA PRESENTATIONS

APPENDIX B1

Congener Concentrations and Contributions to TEQ

APPENDIX B2

Homologue Concentrations and Contributions to TEQ

APPENDIX B3

PCDD and PCDF Concentrations and Contributions to TEQ

APPENDIX B4

QC Sample Congener Concentrations and Contributions to TEQ

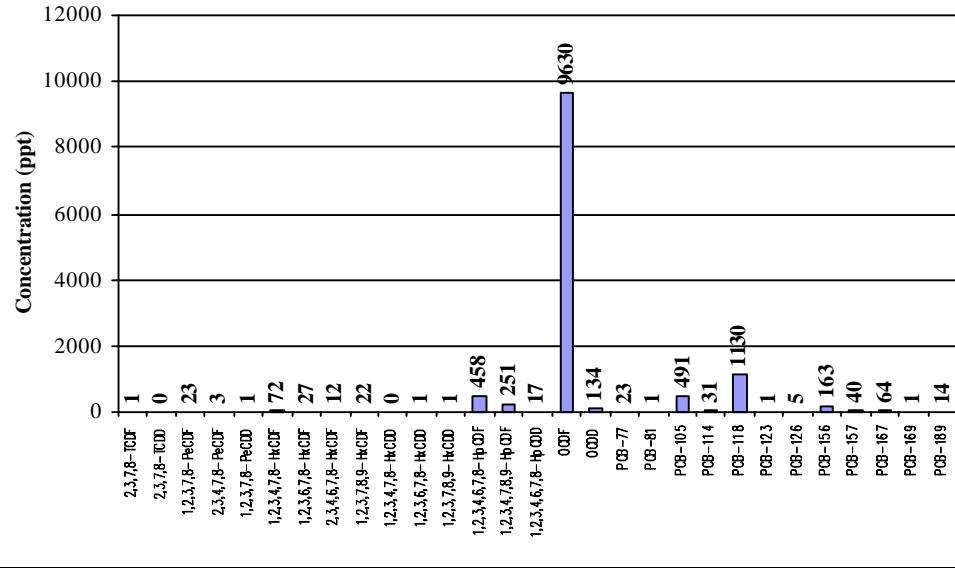
These results were used in congener pattern analysis.

Sample 463

SI

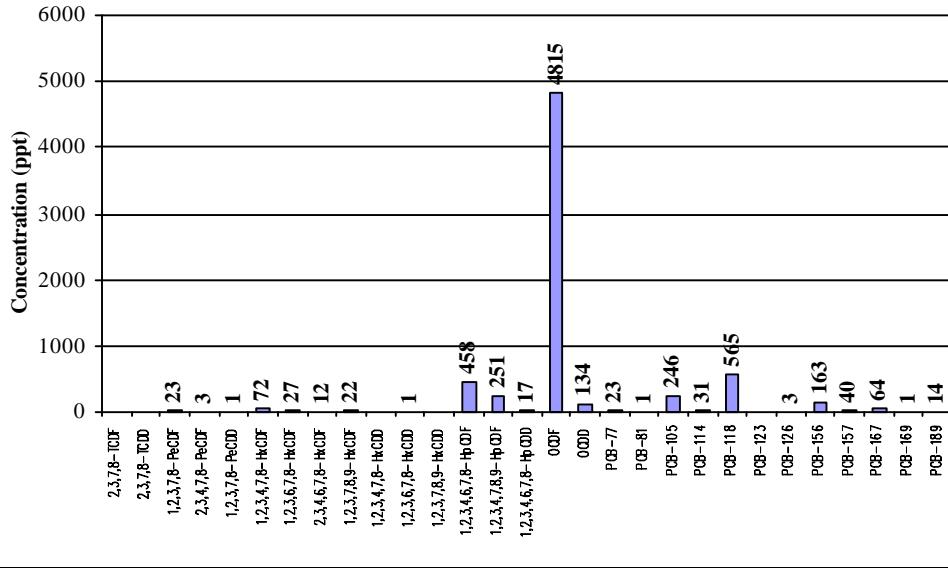
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



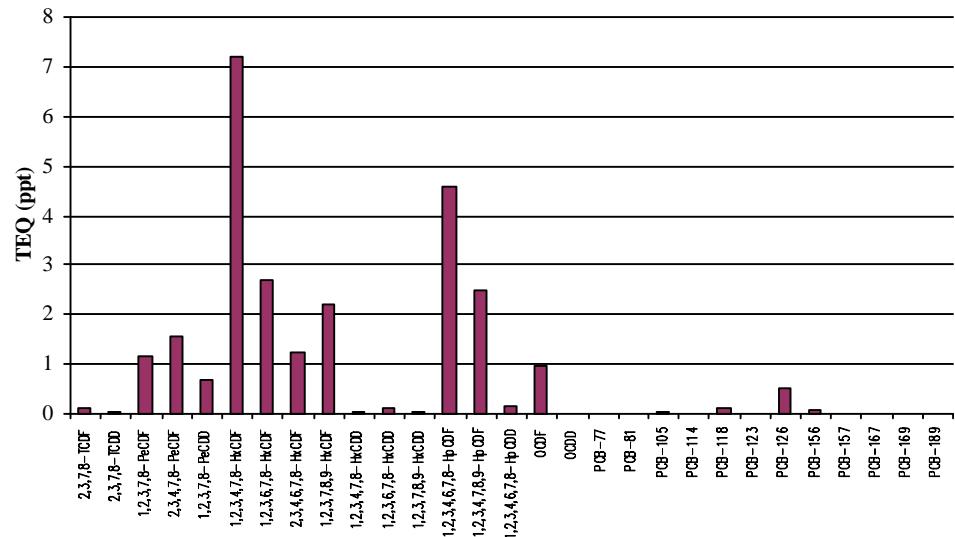
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



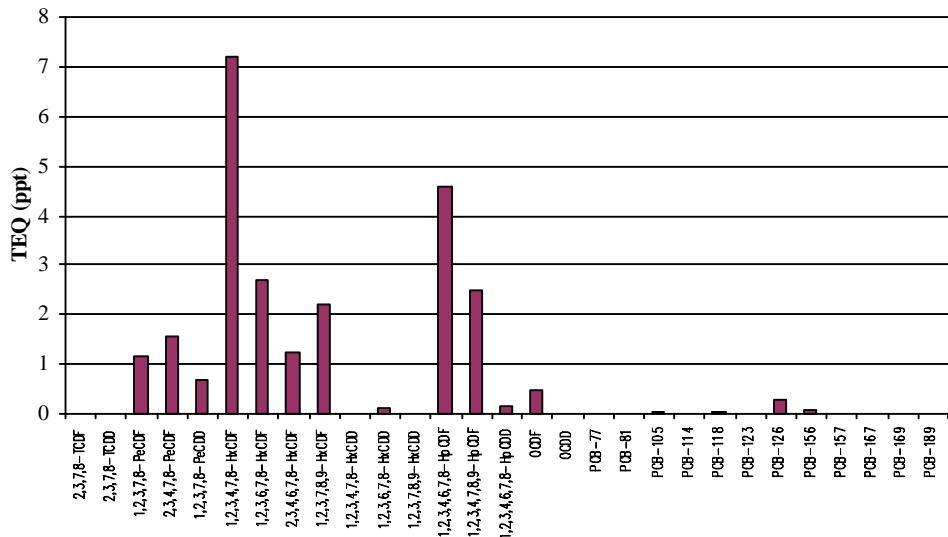
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile

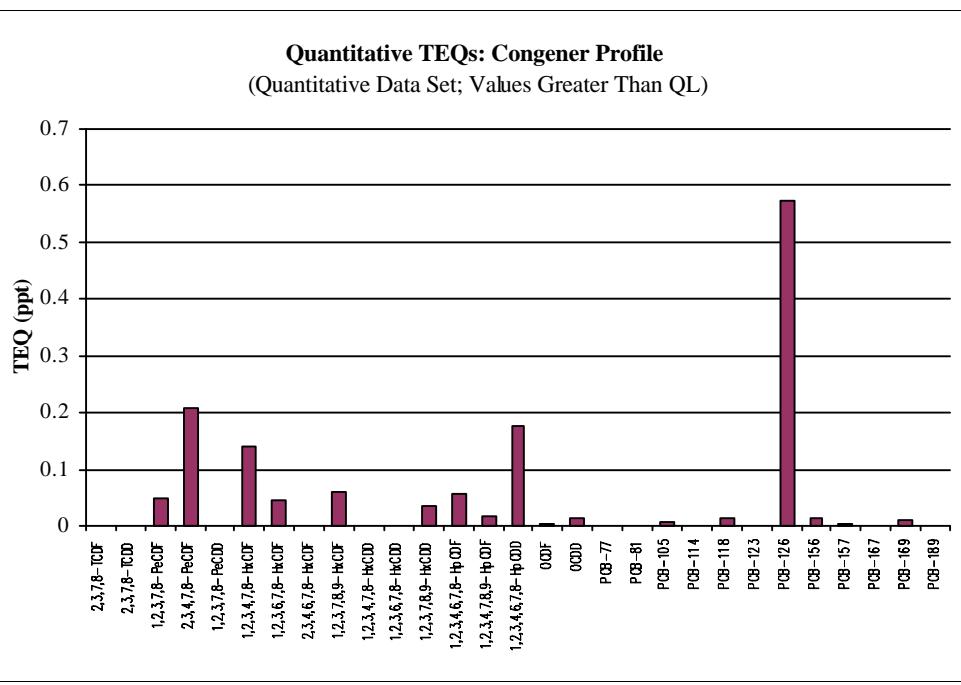
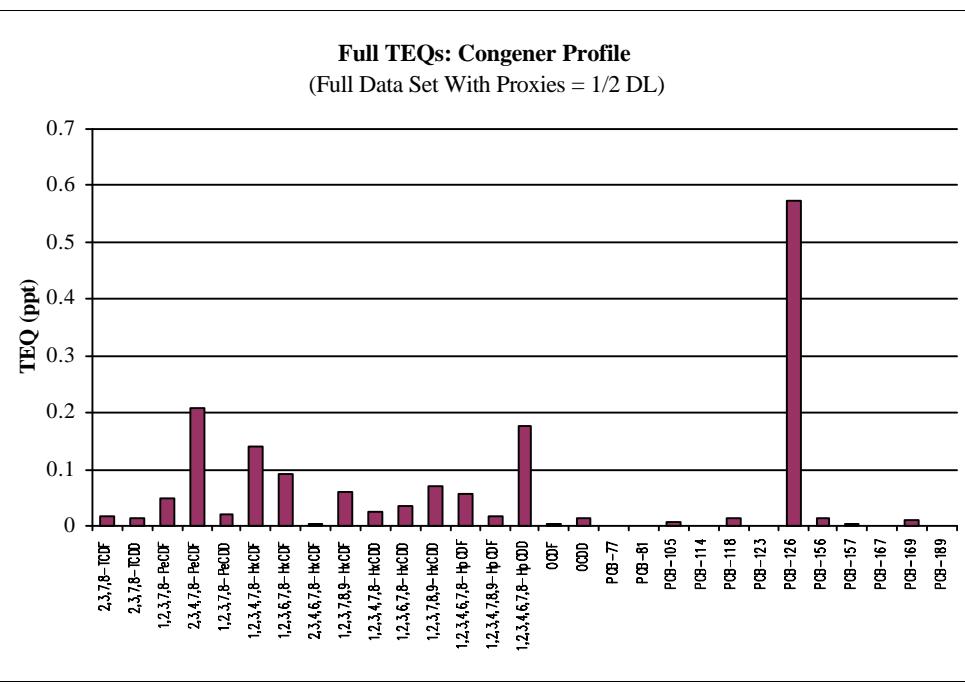
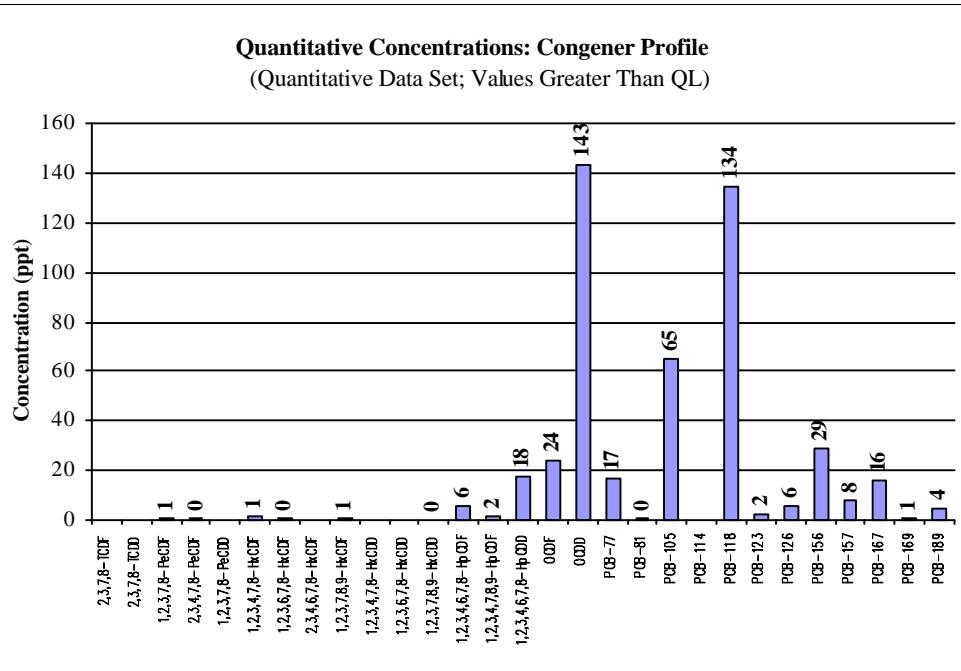
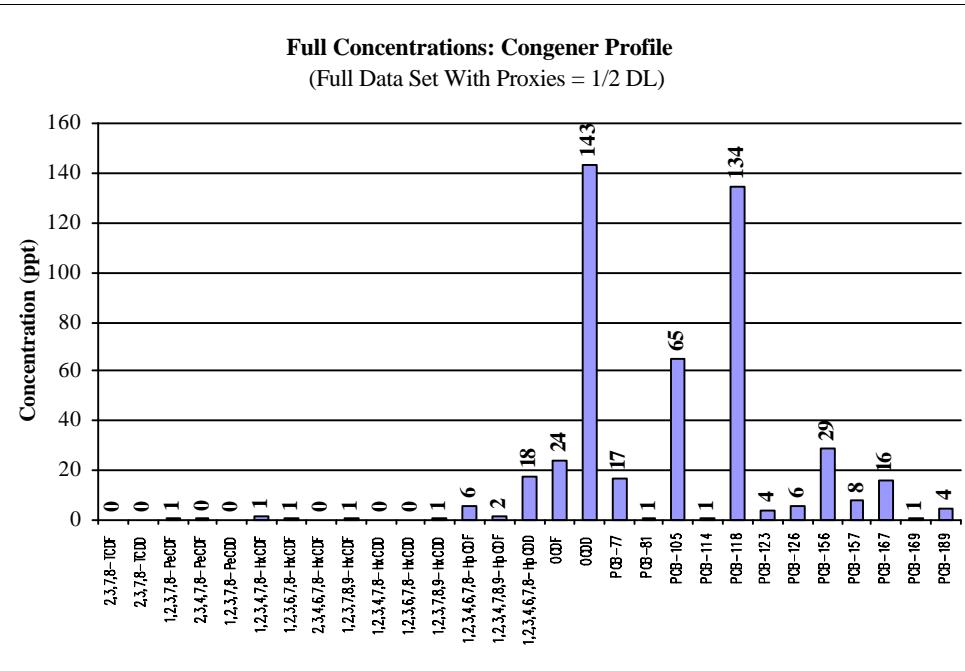
(Quantitative Data Set; Values Greater Than QL)



These results were used in congener pattern analysis.

Sample 318

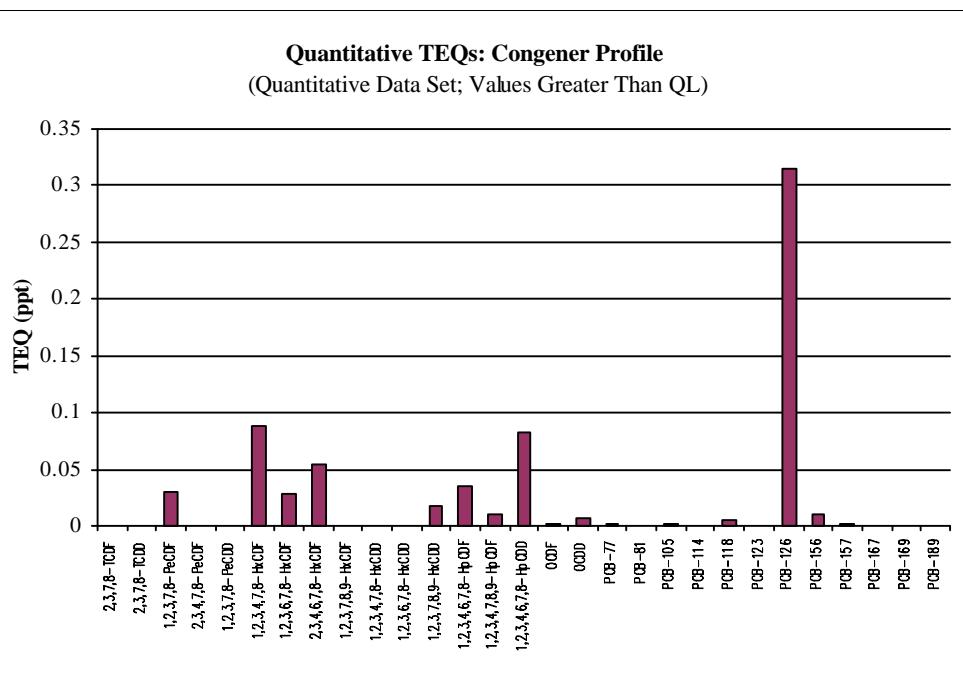
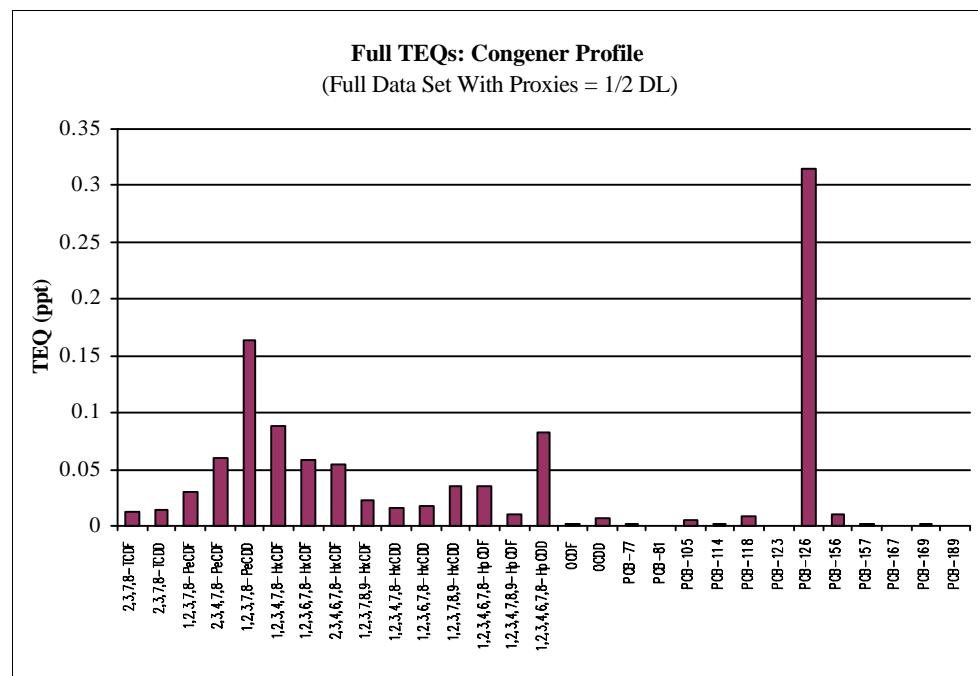
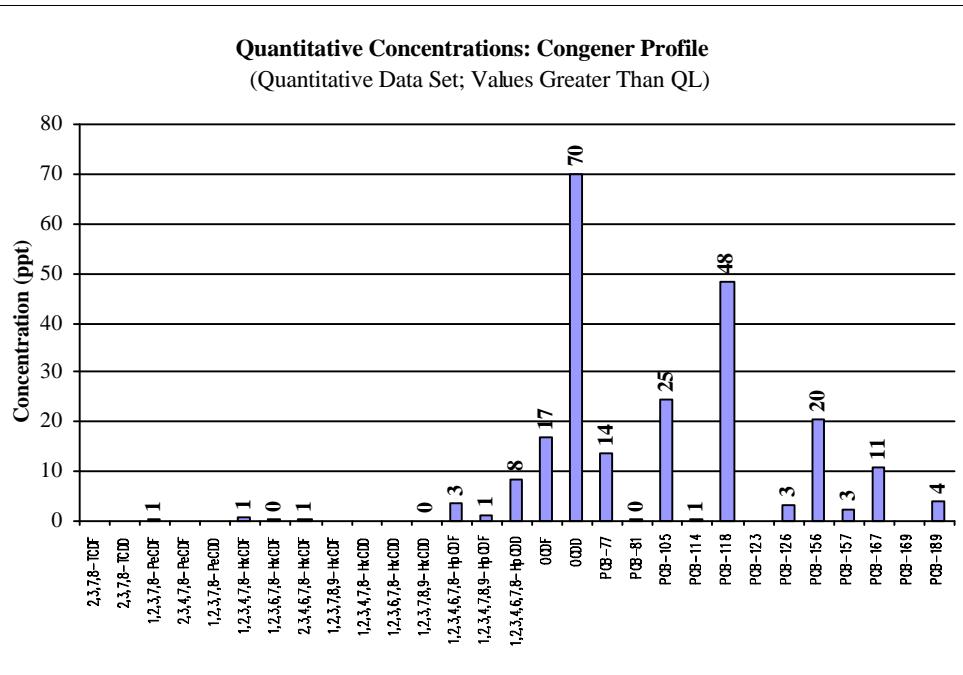
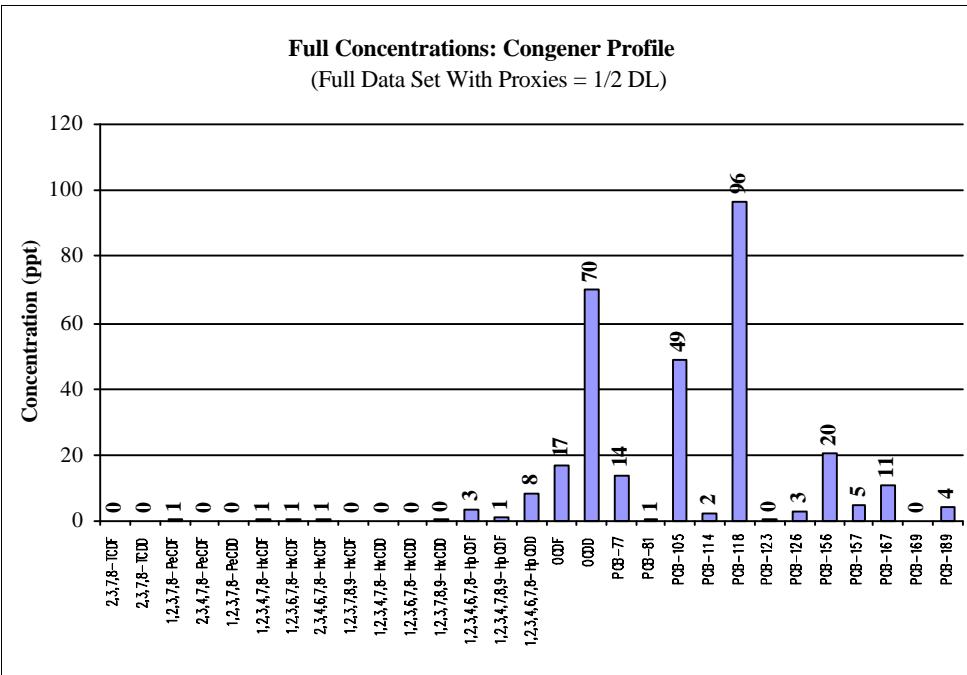
S11



These results were used in congener pattern analysis.

Sample 567

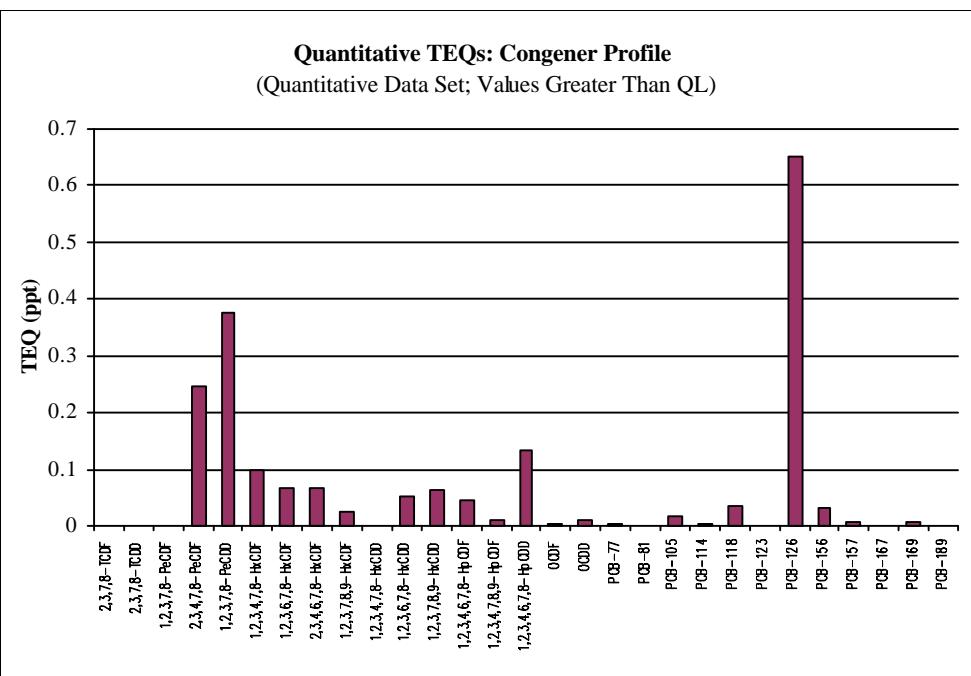
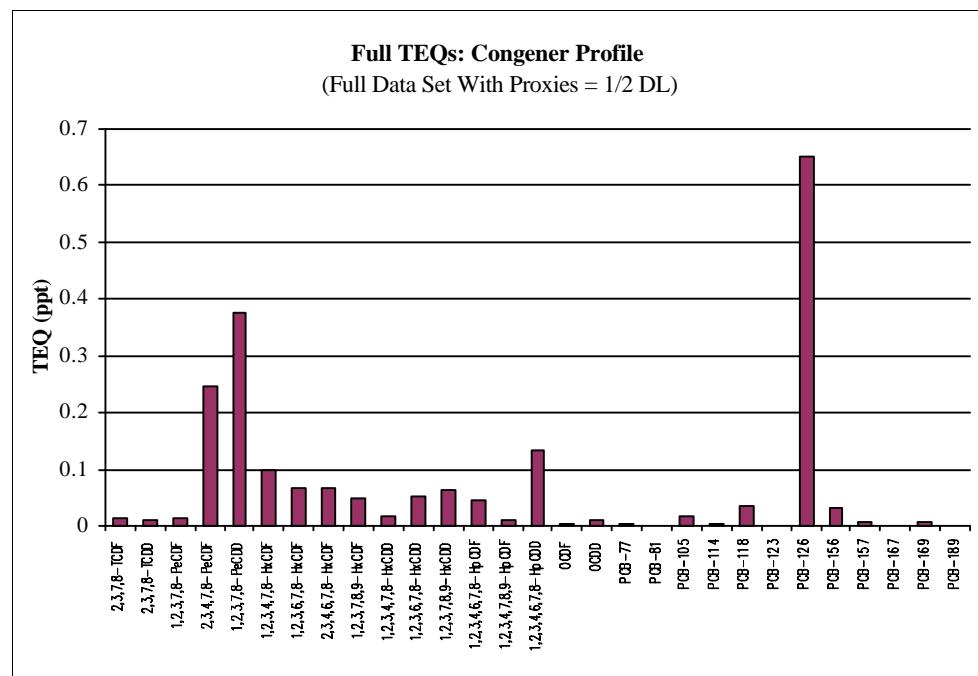
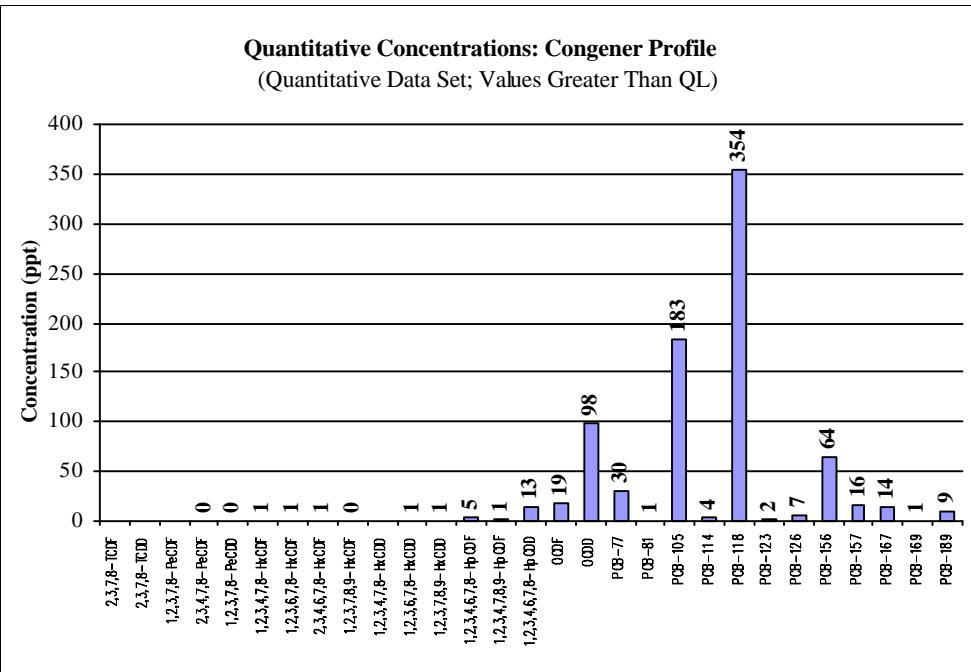
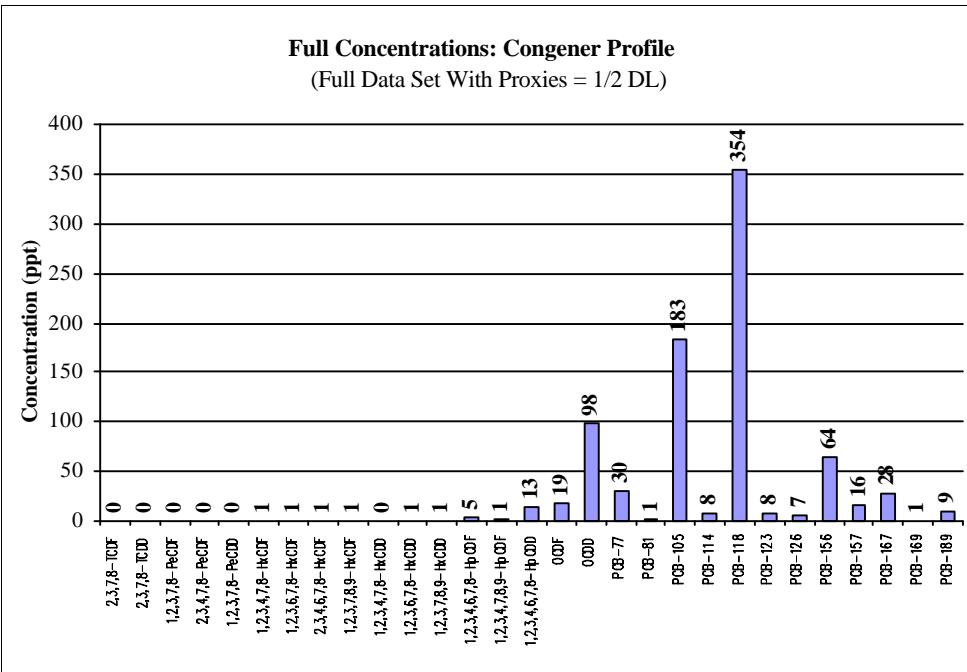
S12



These results were used in congener pattern analysis.

Sample 187

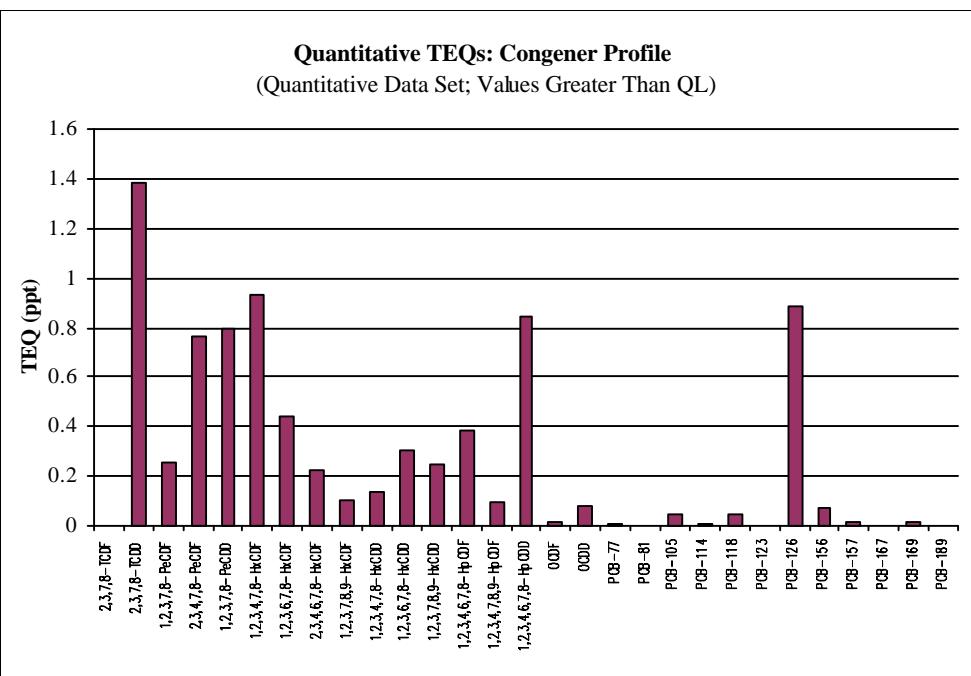
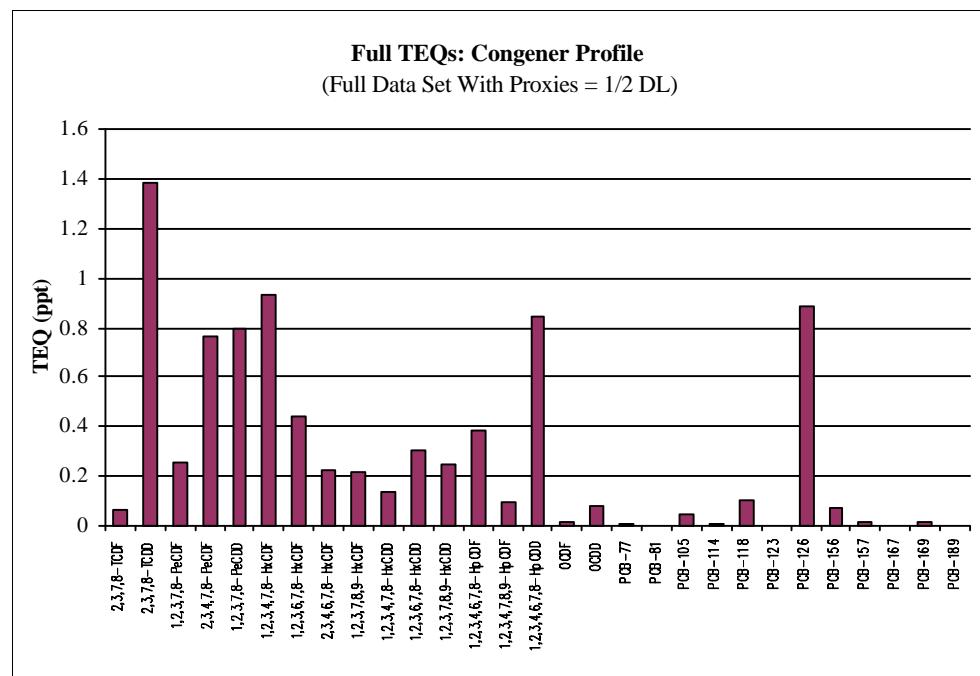
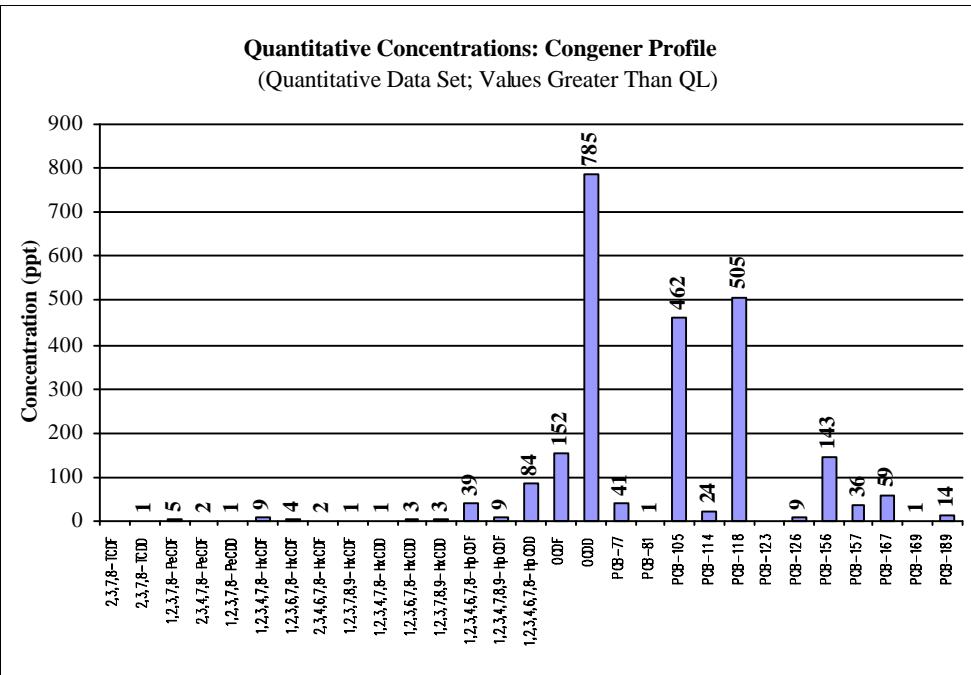
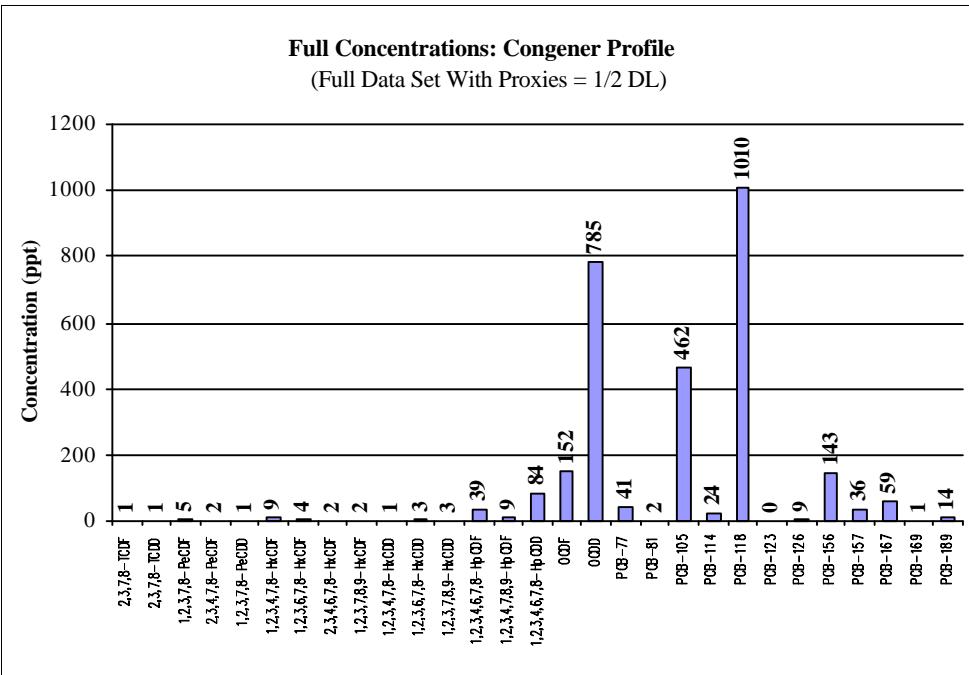
S19



These results were used in congener pattern analysis.

Sample 429

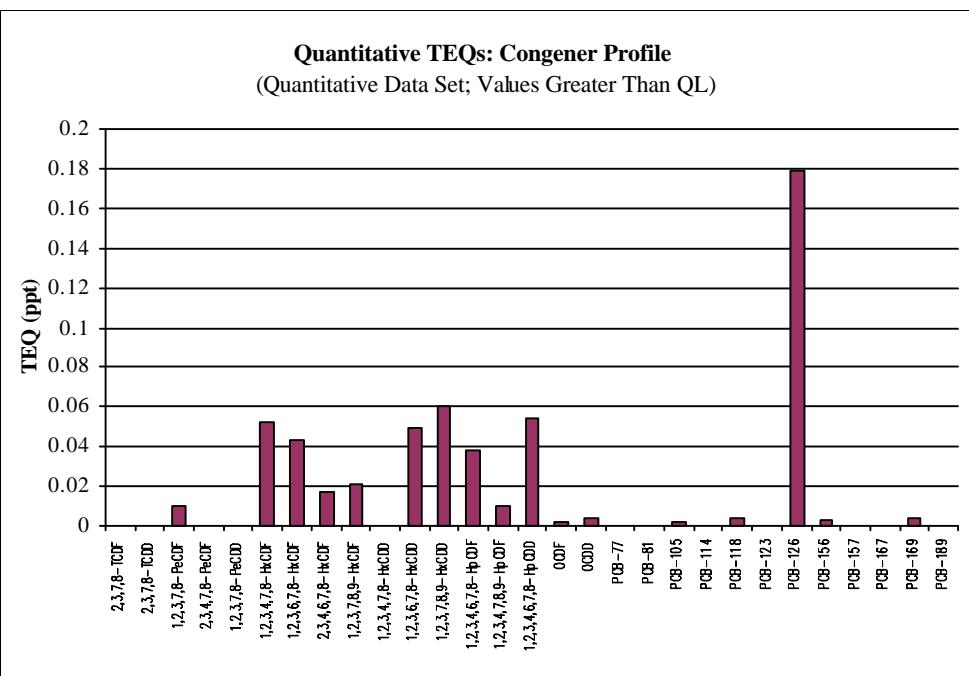
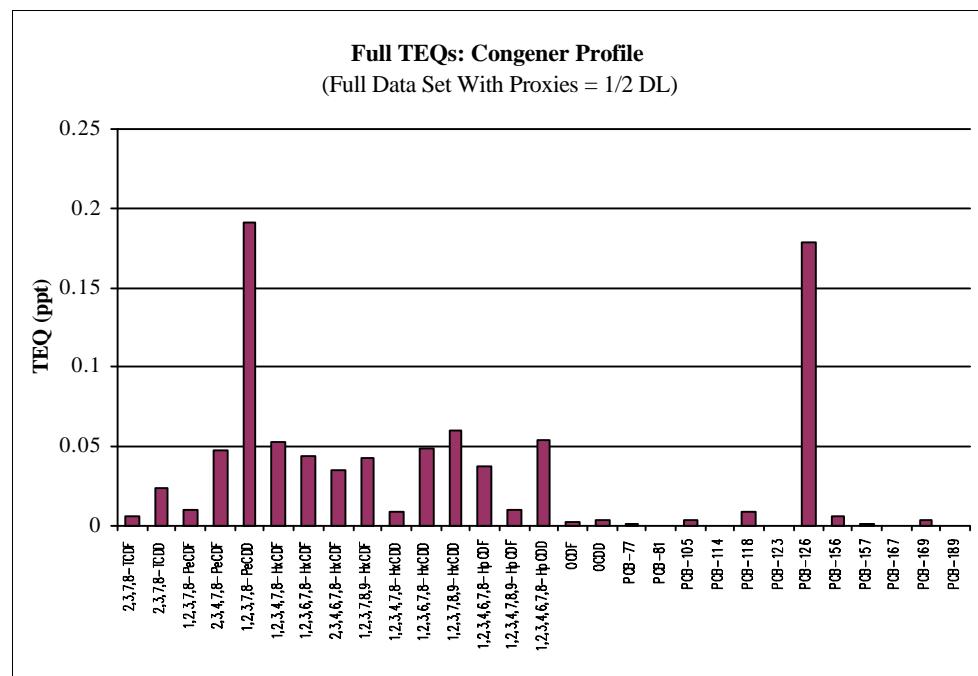
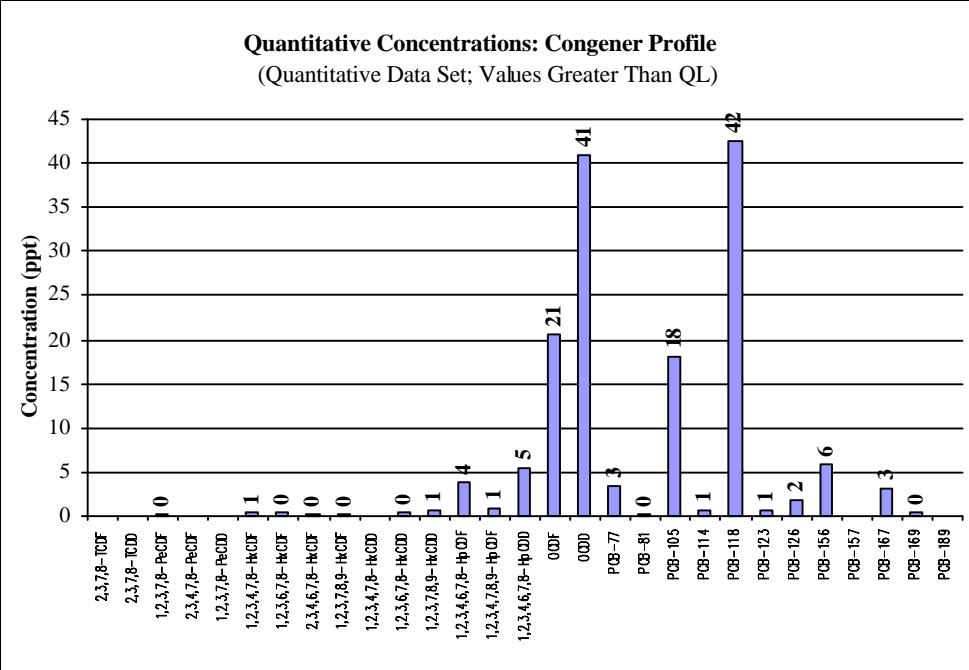
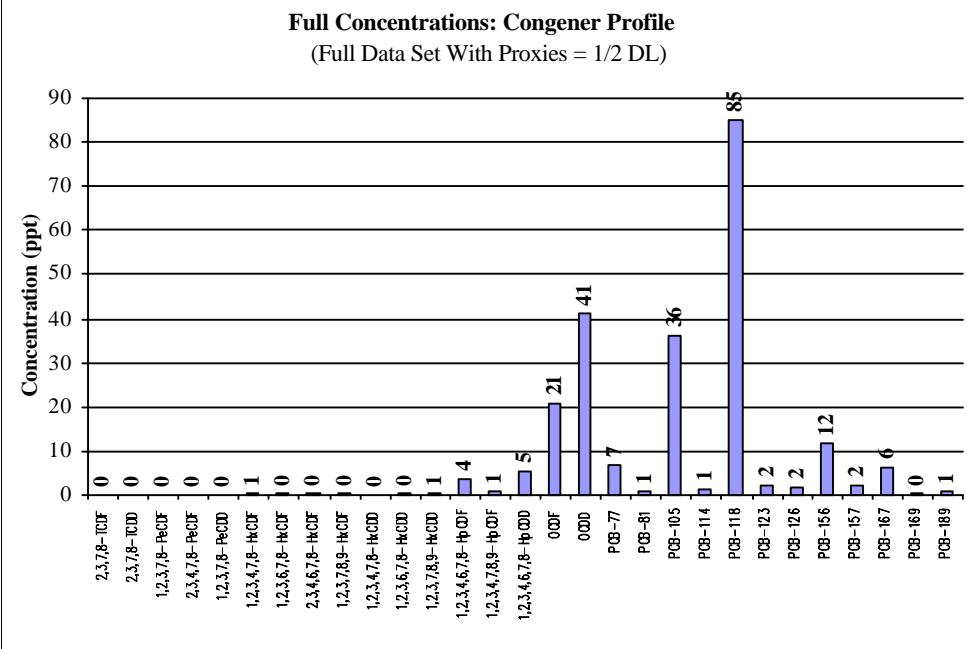
S2



These results were used in congener pattern analysis.

Sample 291

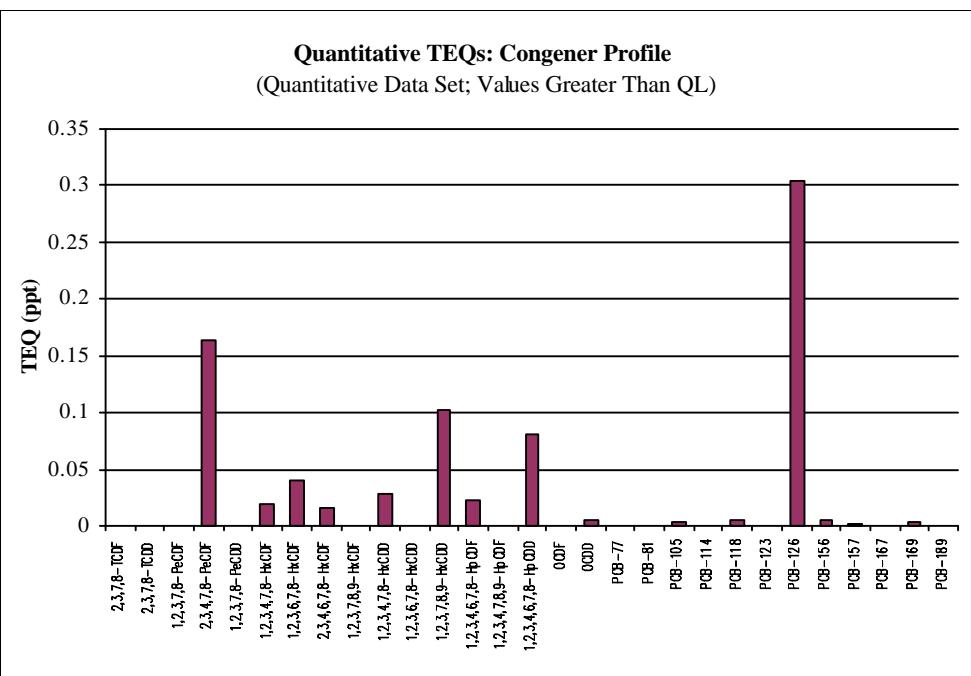
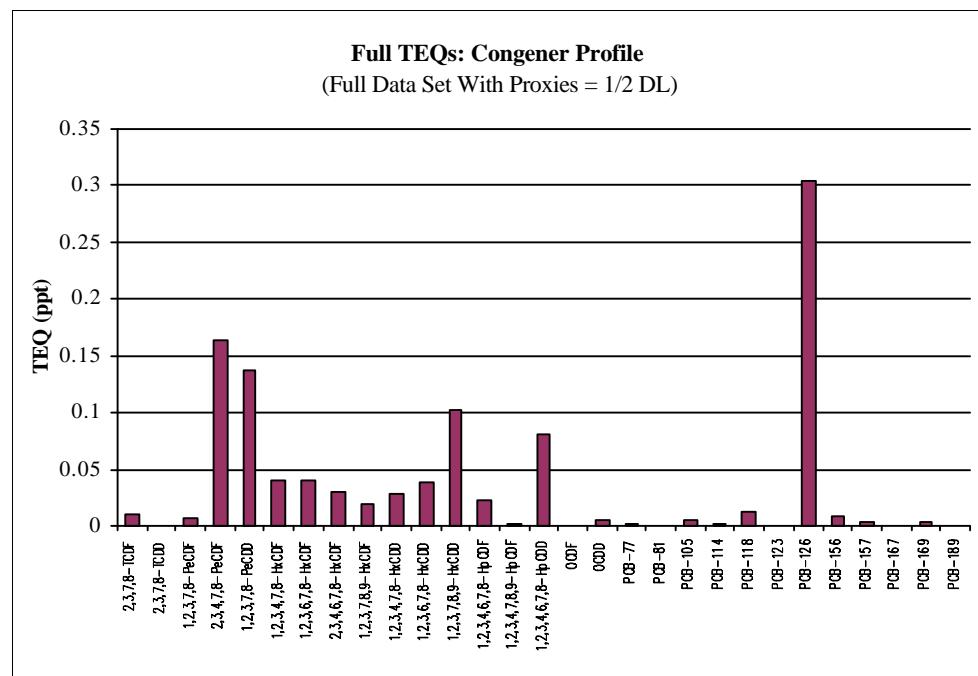
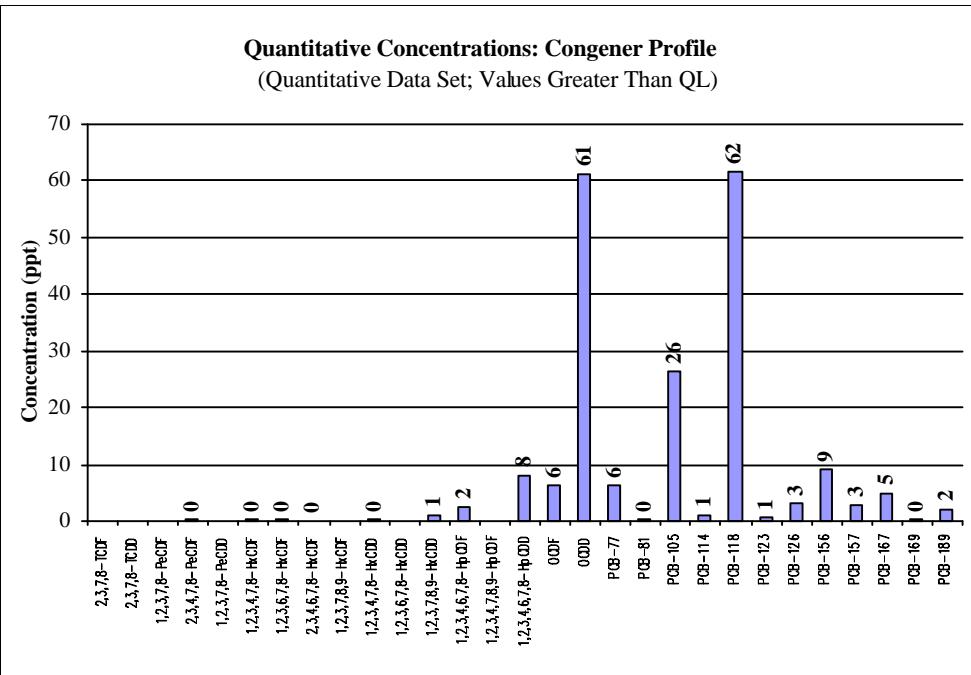
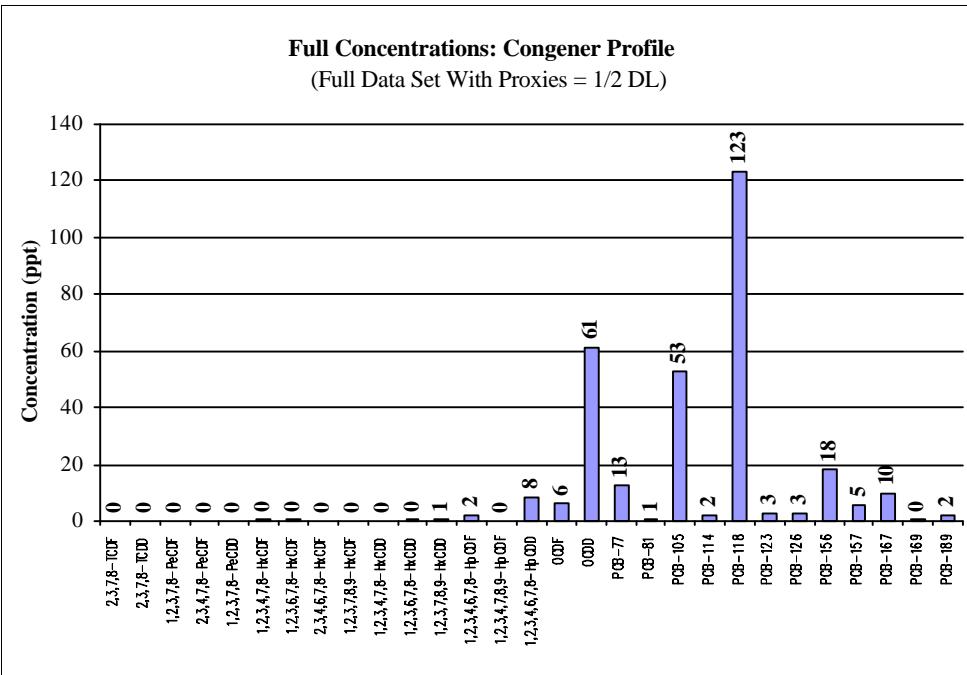
S20



These results were used in congener pattern analysis.

Sample 644

S22



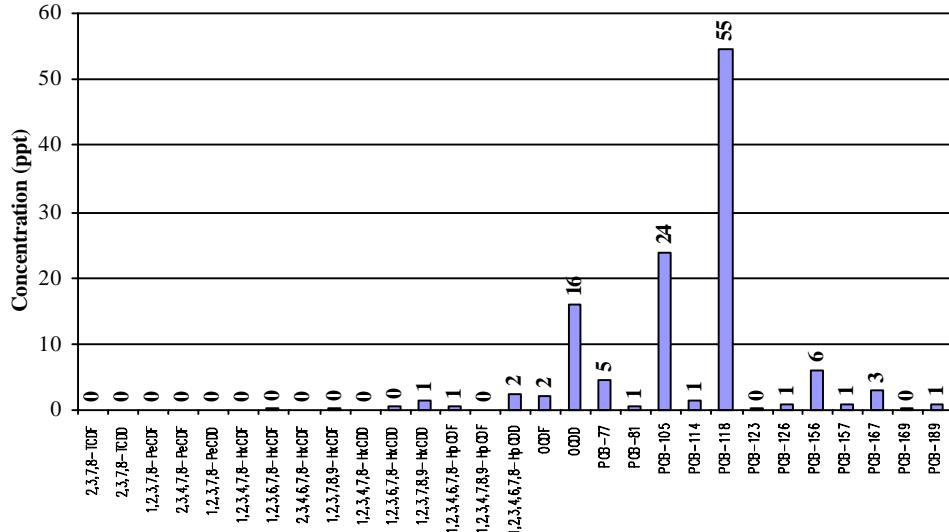
These results were used in congener pattern analysis.

Sample 521

S23

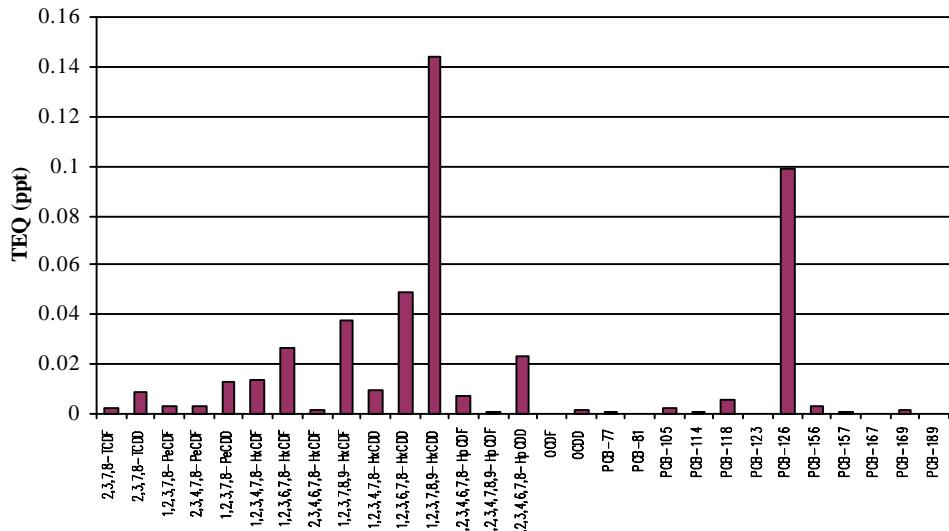
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



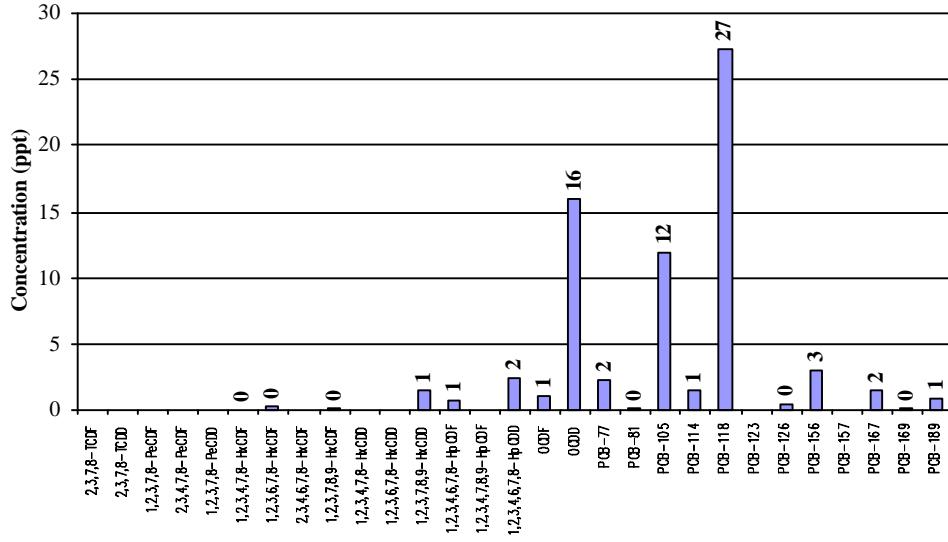
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)

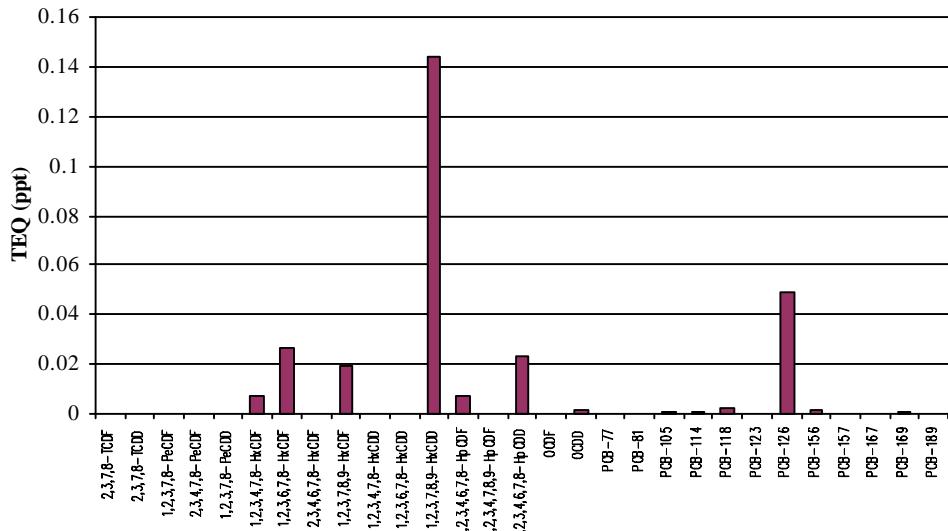


Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



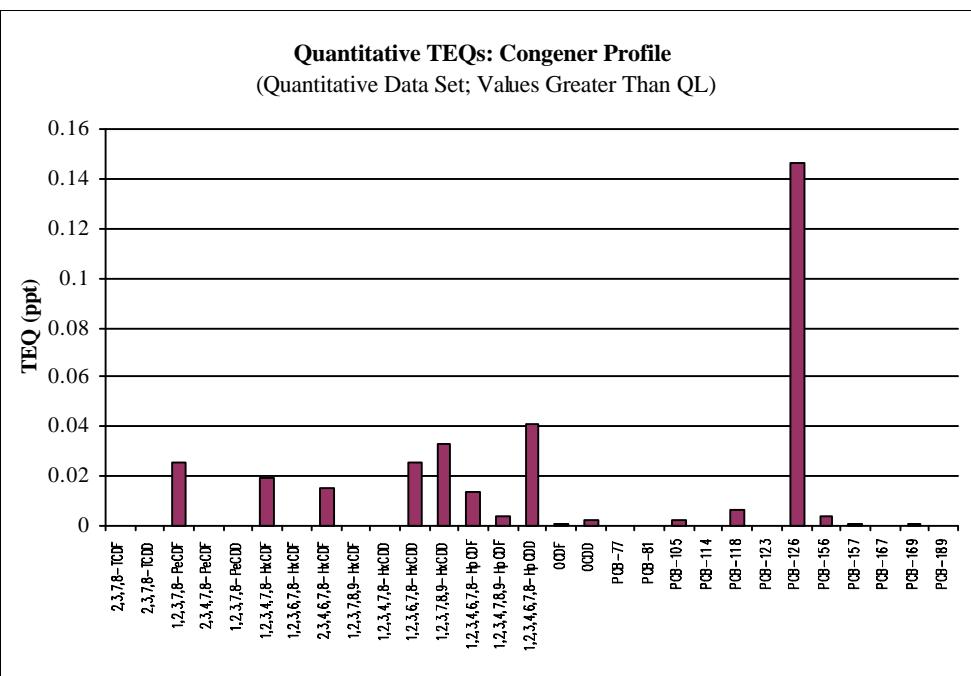
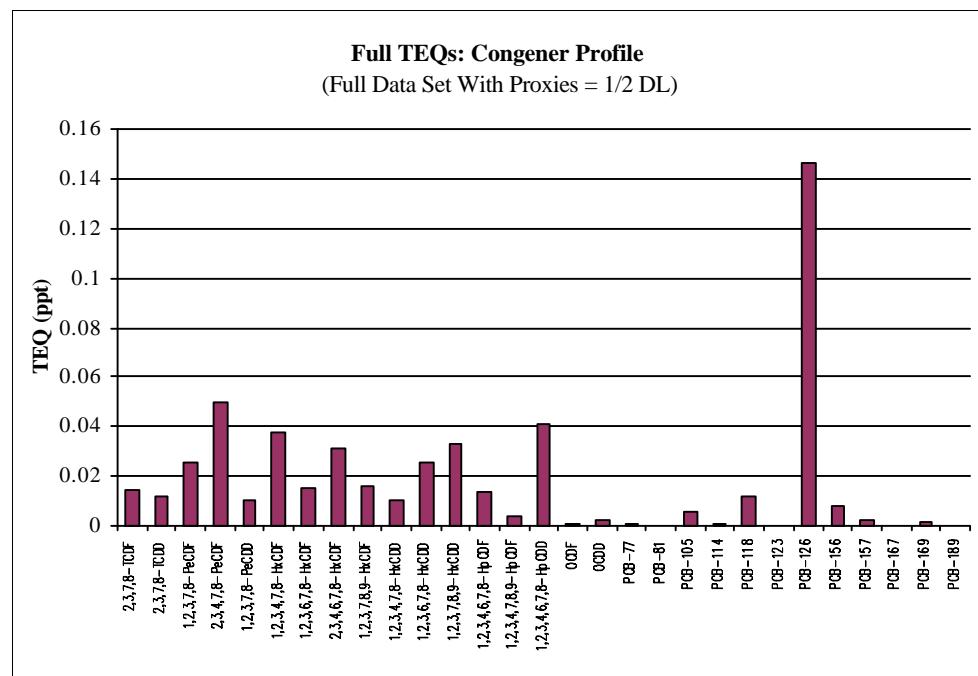
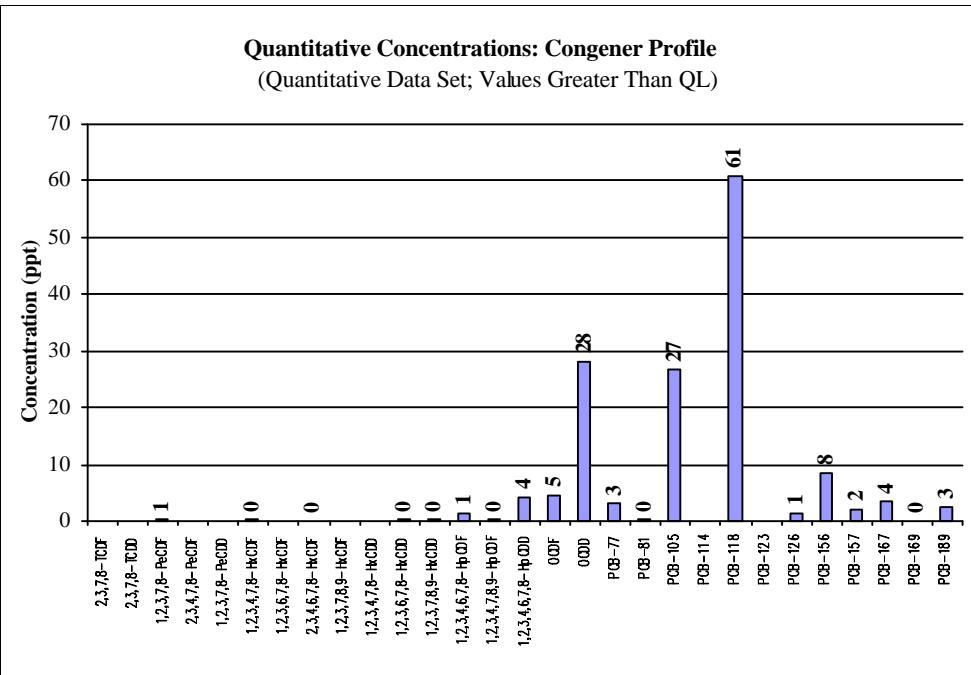
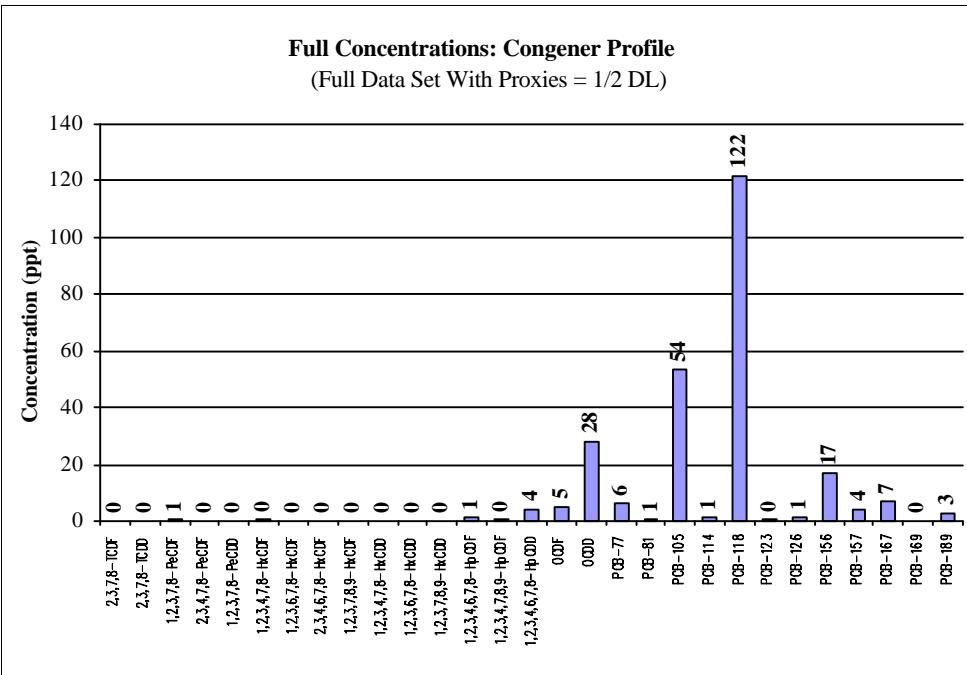
Quantitative TEQs: Congener Profile



These results were used in congener pattern analysis.

Sample 385

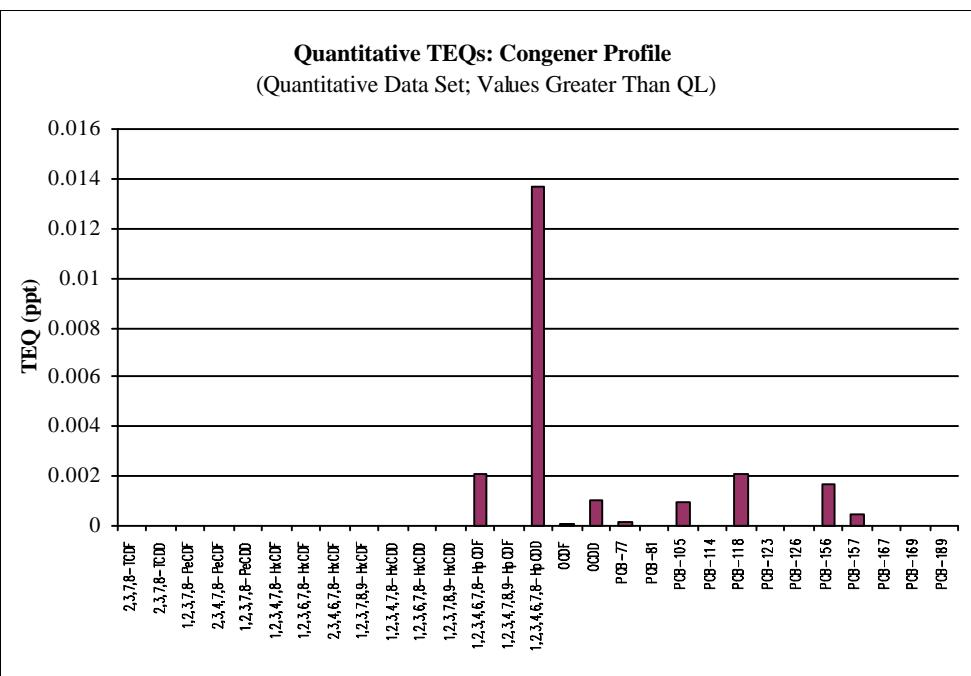
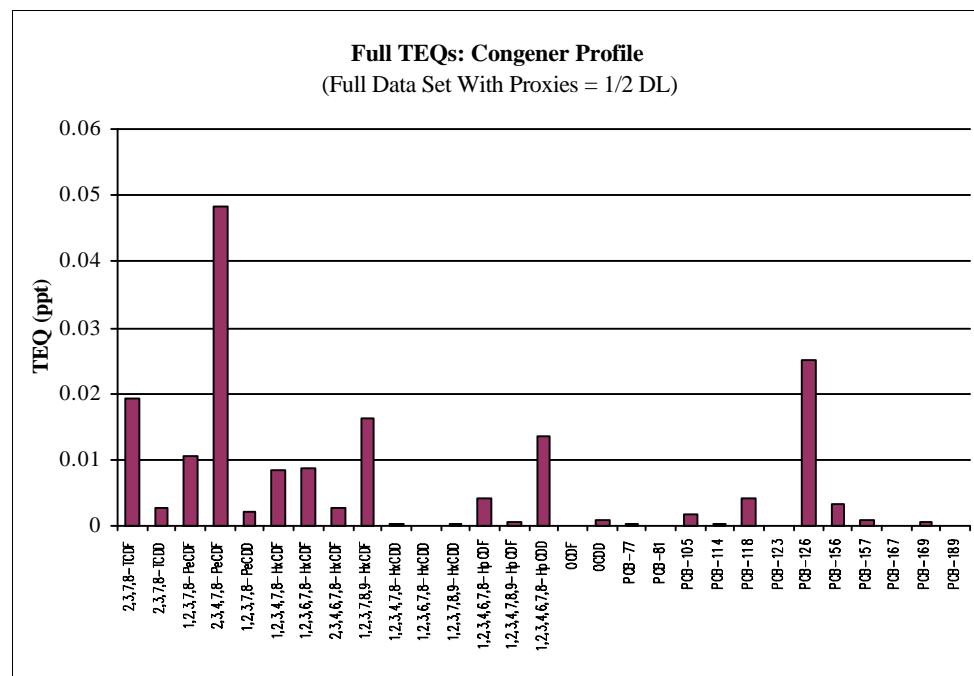
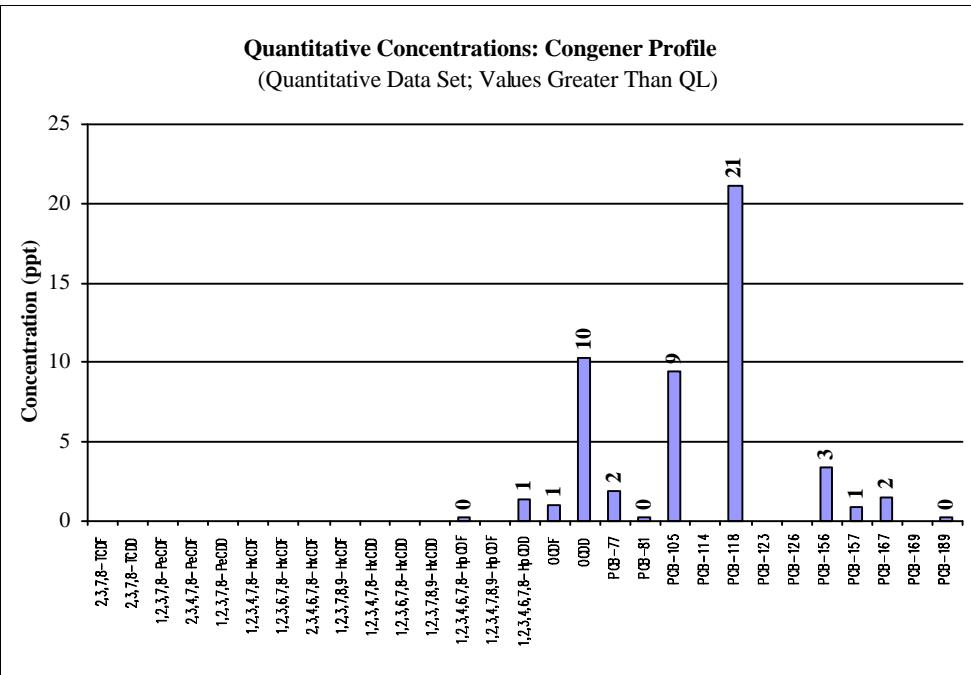
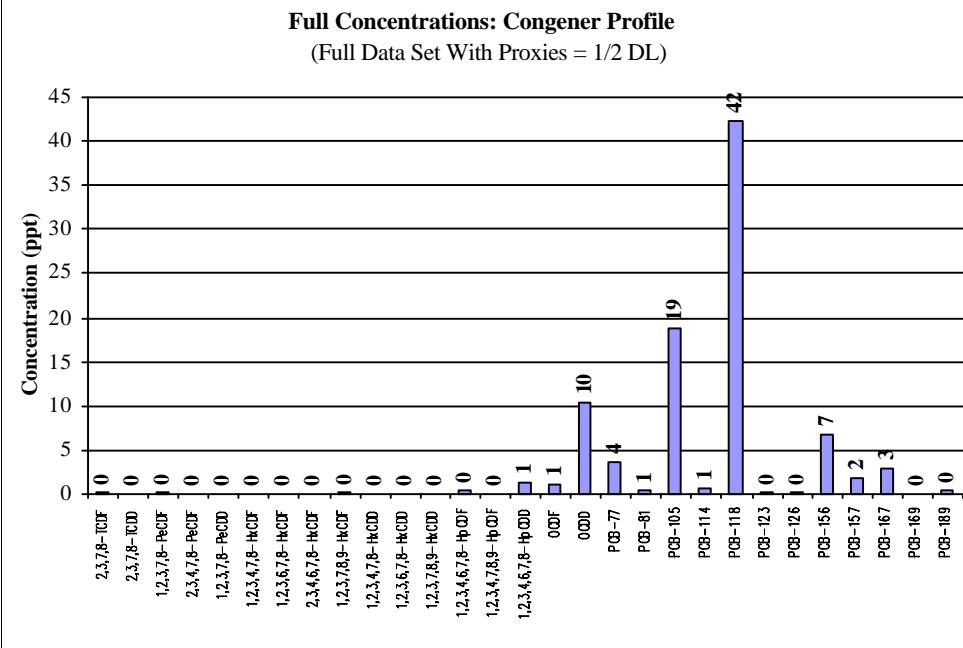
S24



These results were used in congener pattern analysis.

Sample 847

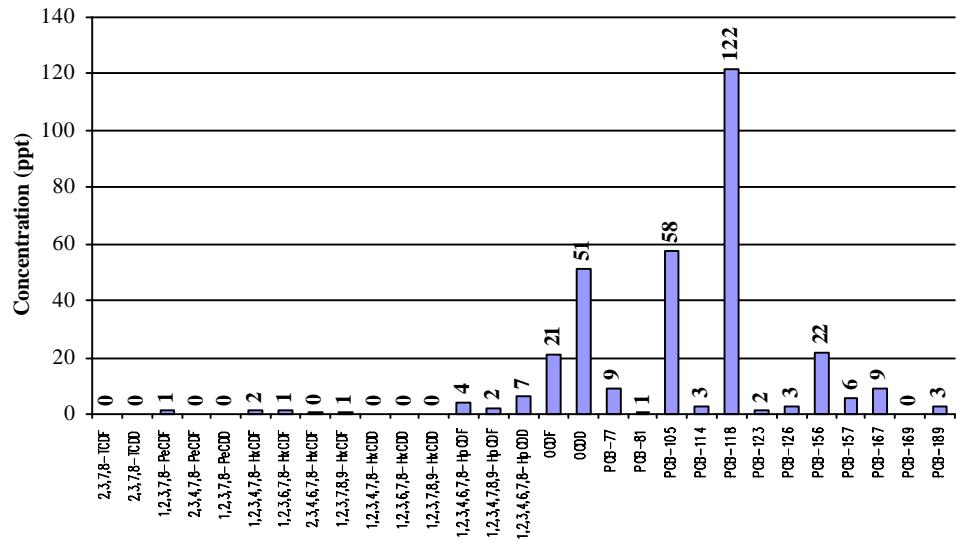
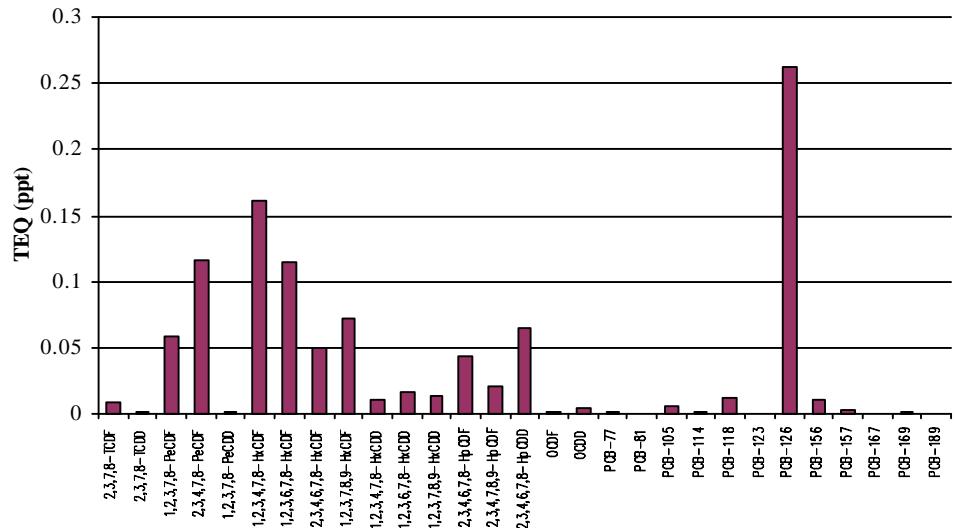
S25



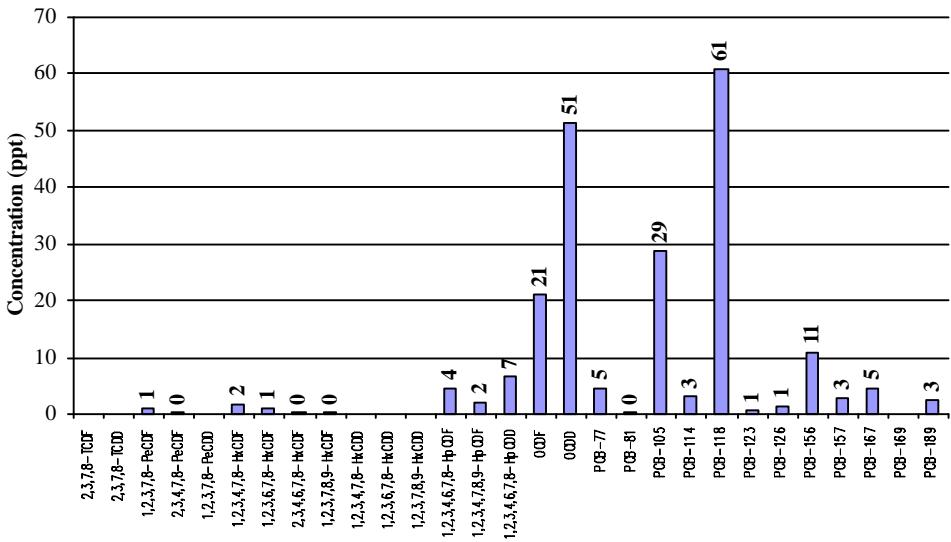
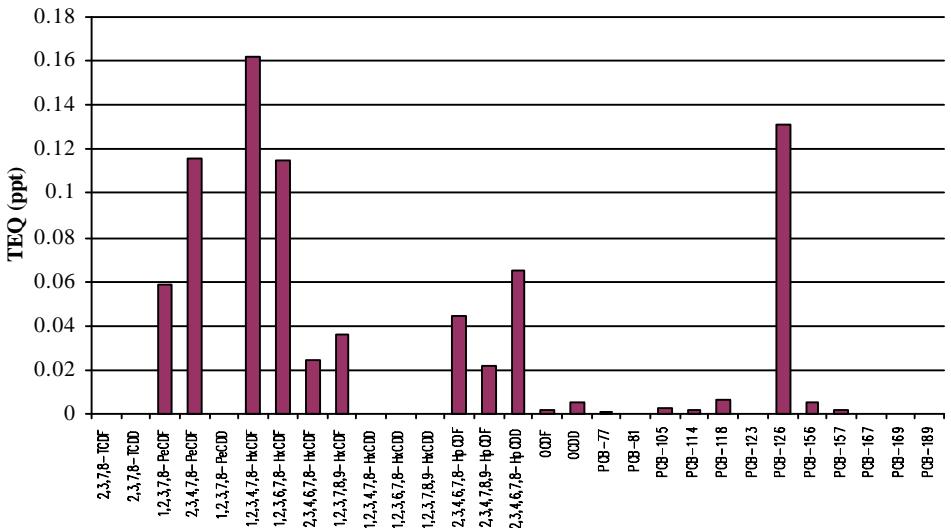
These results were used in congener pattern analysis.

Sample 547**S26****Full Concentrations: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Full TEQs: Congener Profile**
(Full Data Set With Proxies = 1/2 DL)**Quantitative Concentrations: Congener Profile**

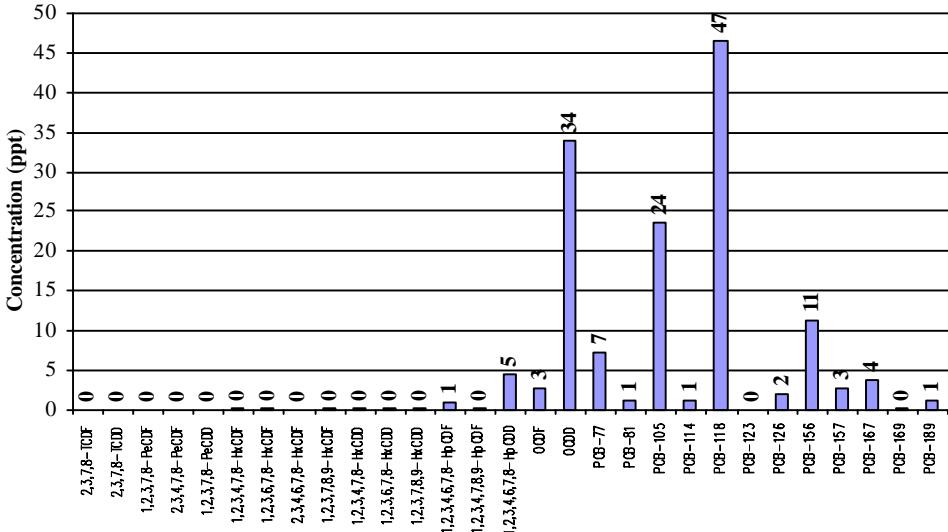
(Quantitative Data Set; Values Greater Than QL)

**Quantitative TEQs: Congener Profile**
(Quantitative Data Set; Values Greater Than QL)

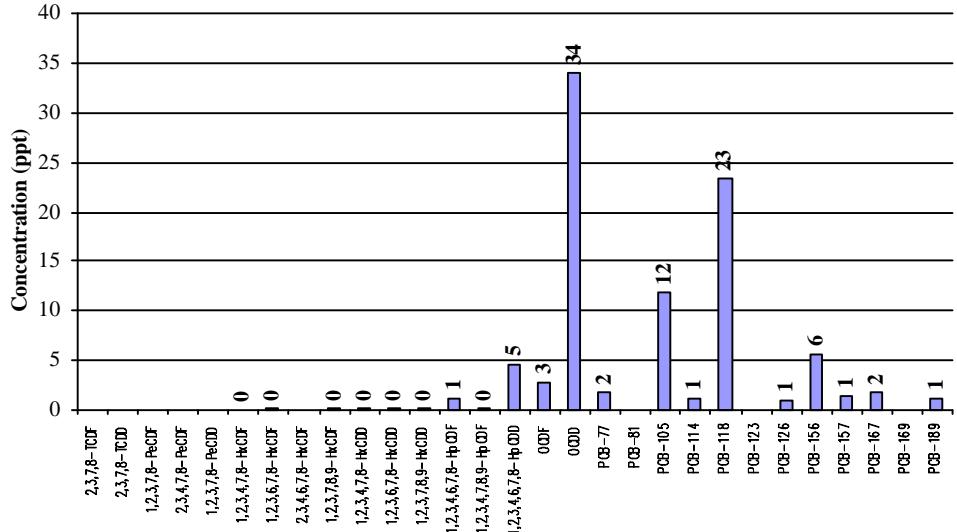
These results were used in congener pattern analysis.

Sample 768**S27****Full Concentrations: Congener Profile**

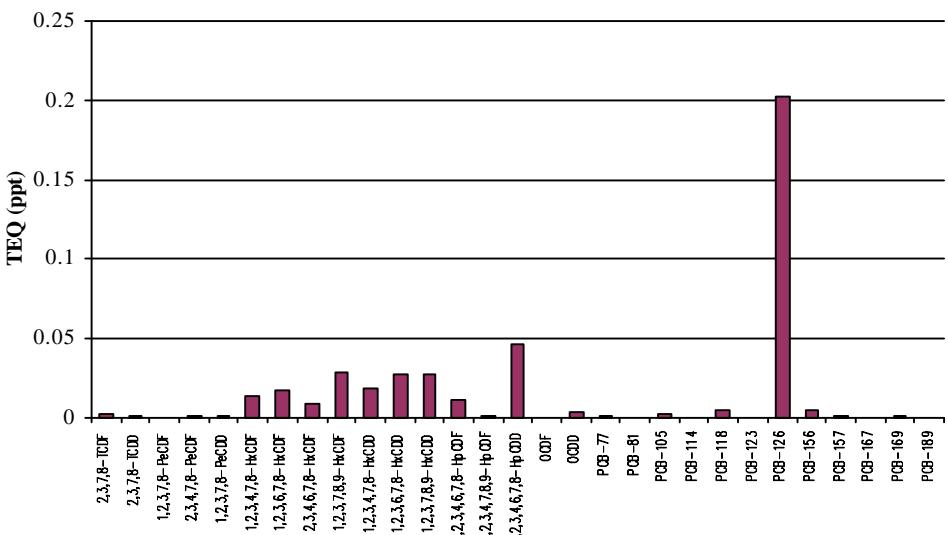
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

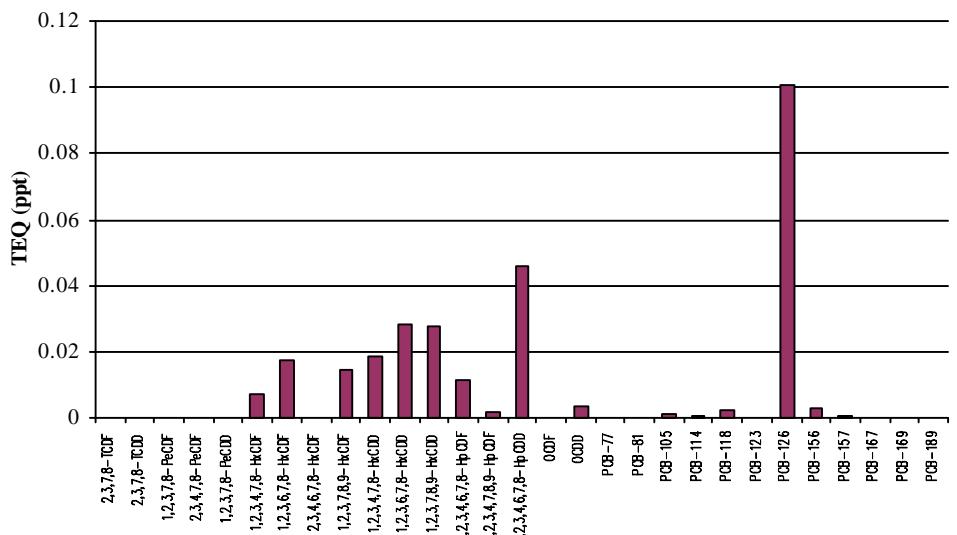
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

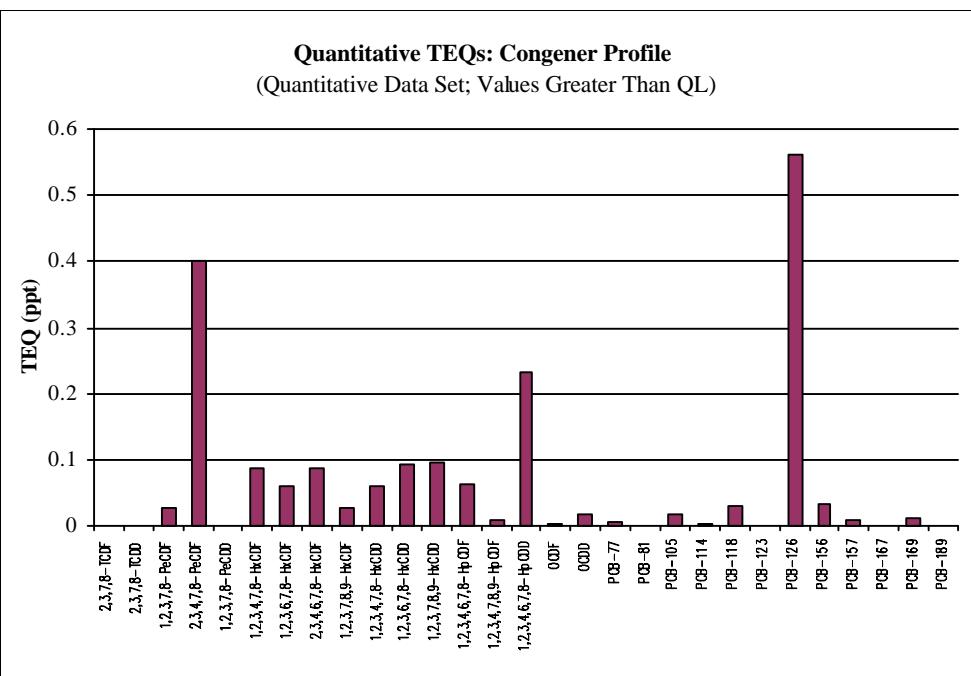
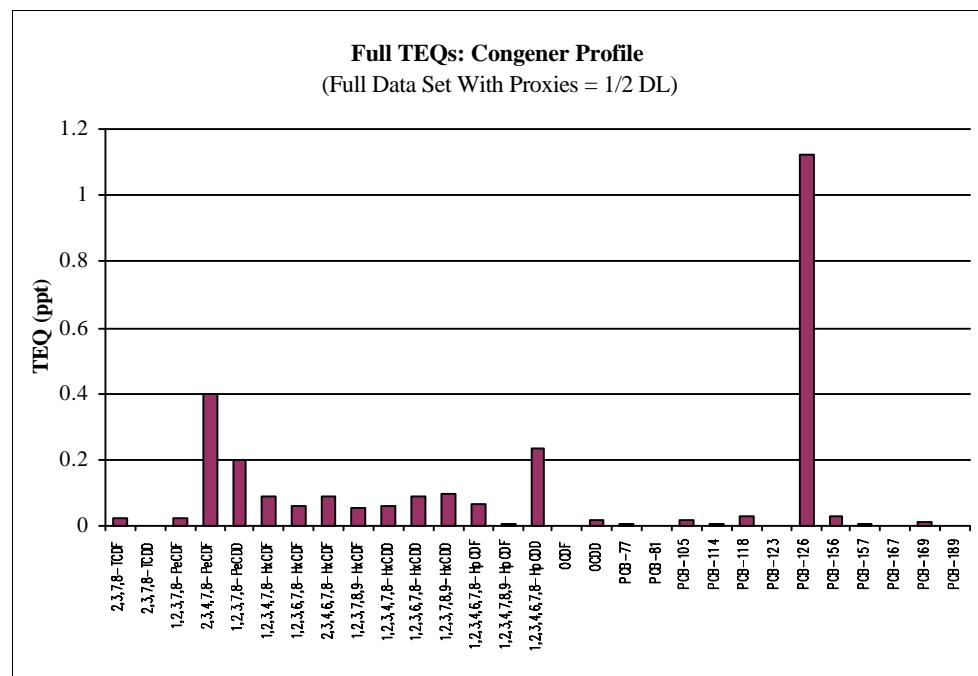
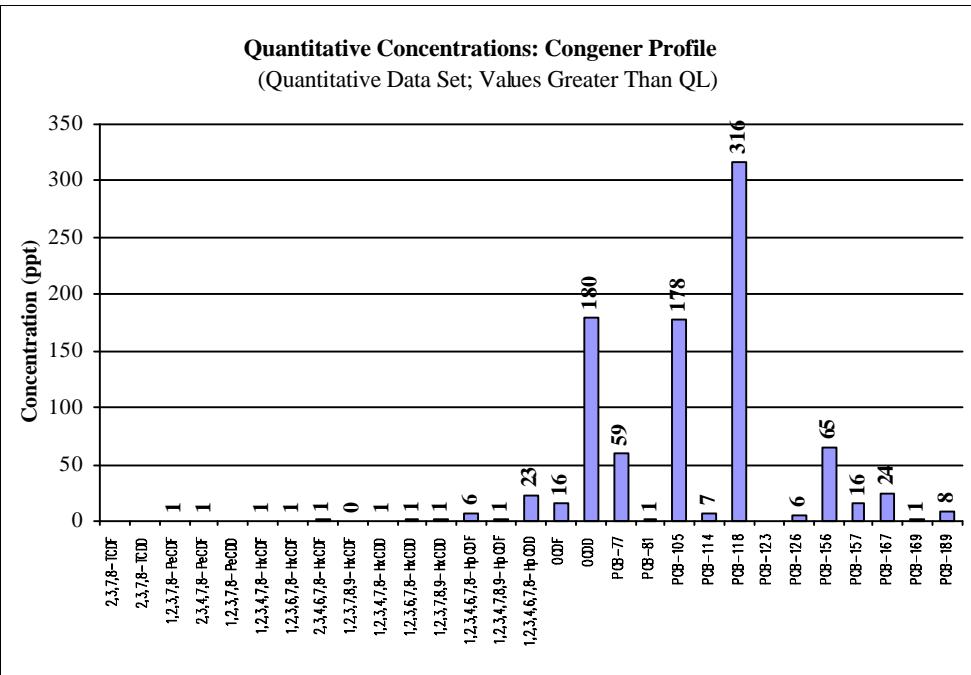
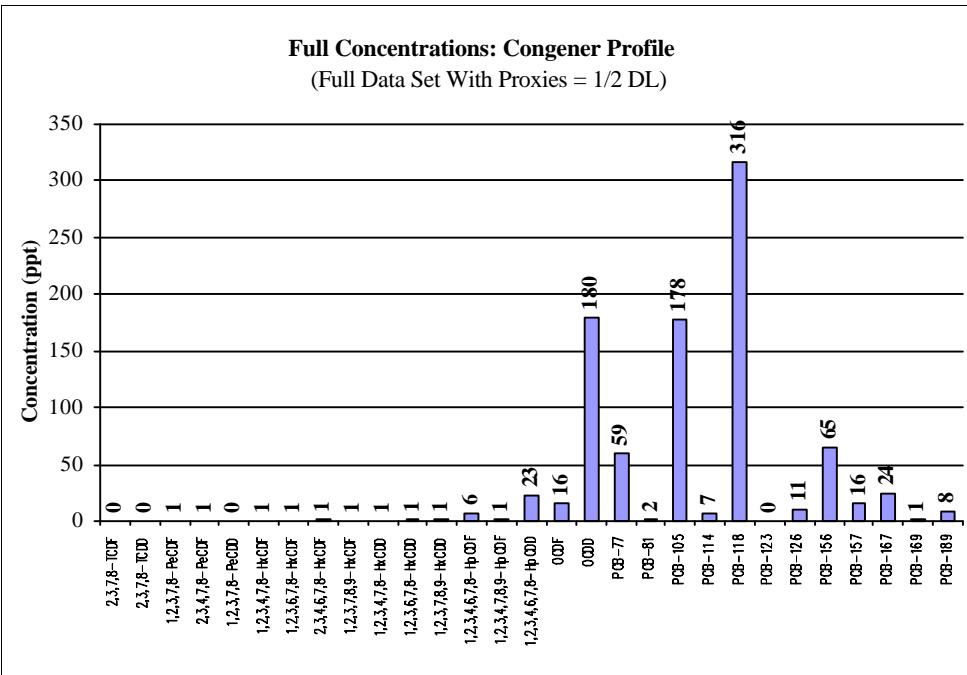
(Quantitative Data Set; Values Greater Than QL)



These results were used in congener pattern analysis.

Sample 264

S28



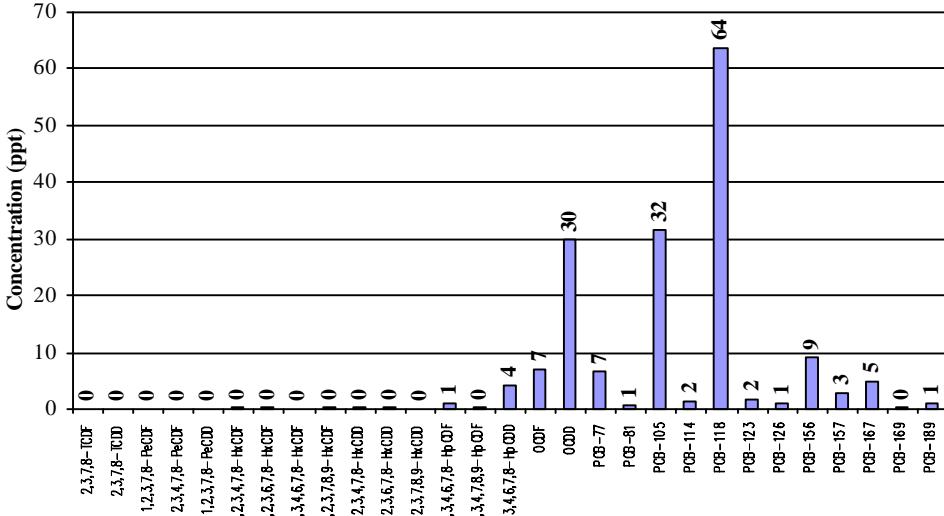
These results were used in congener pattern analysis.

Sample 443

S29

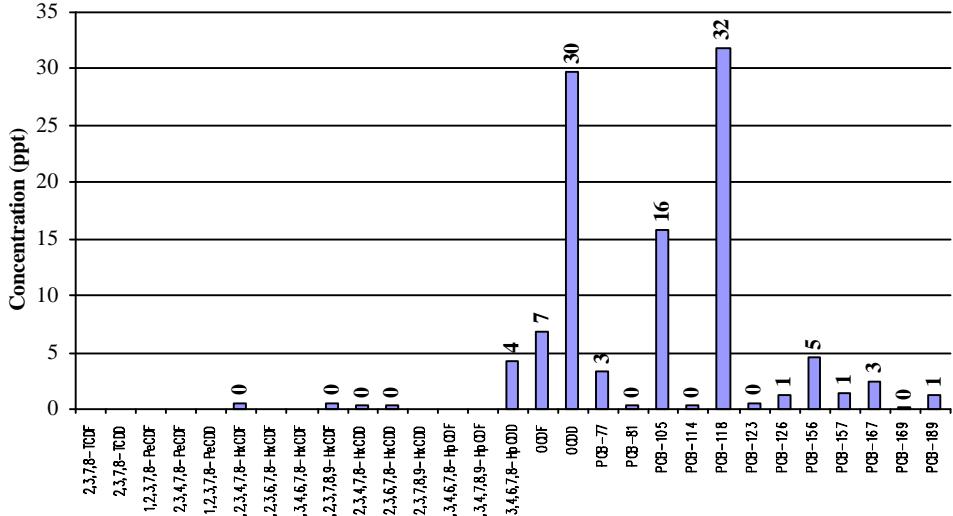
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



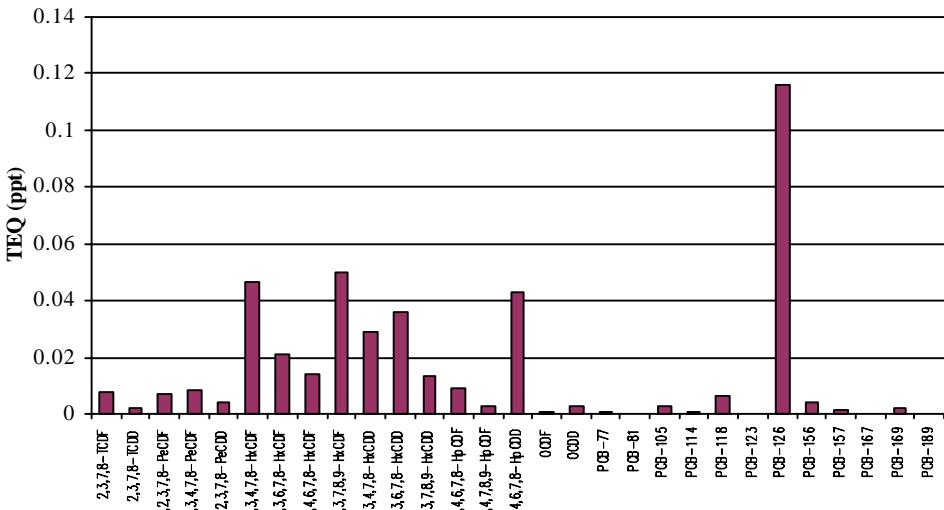
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



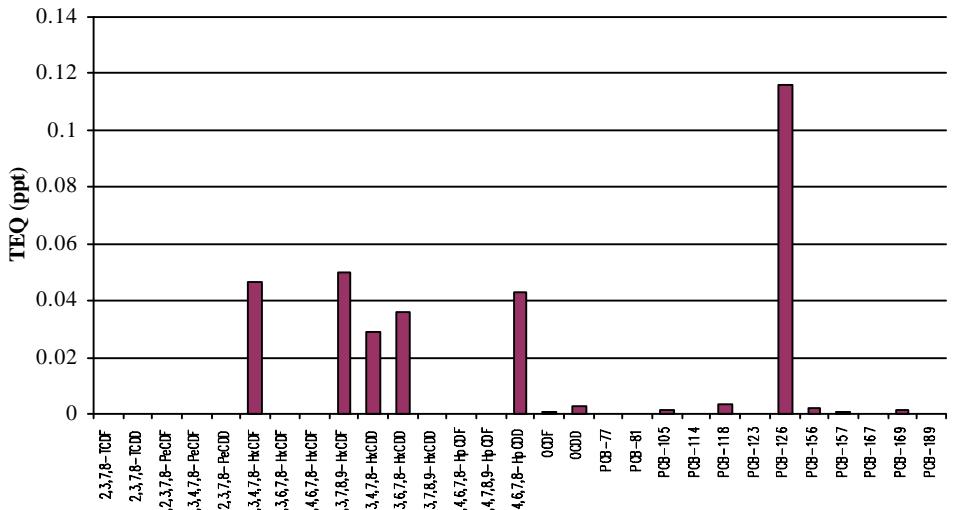
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile

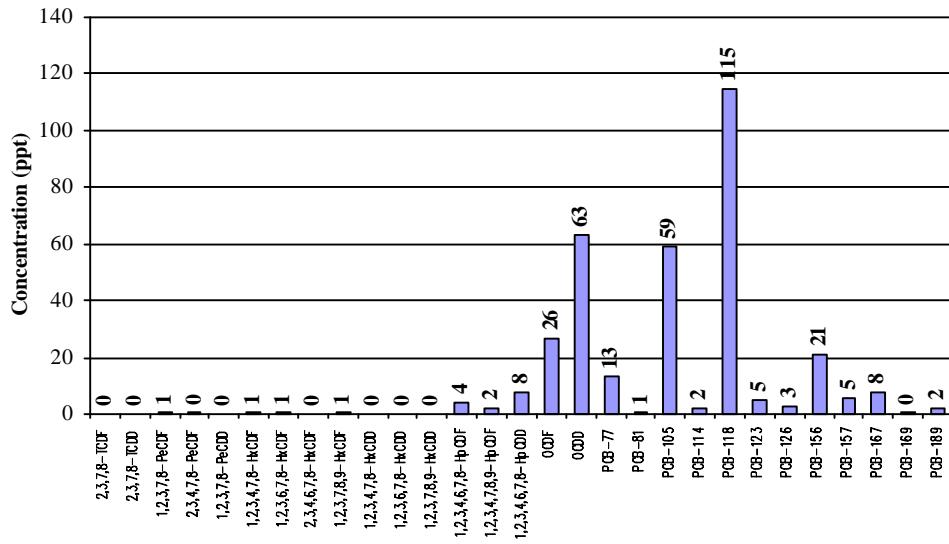
(Quantitative Data Set; Values Greater Than QL)



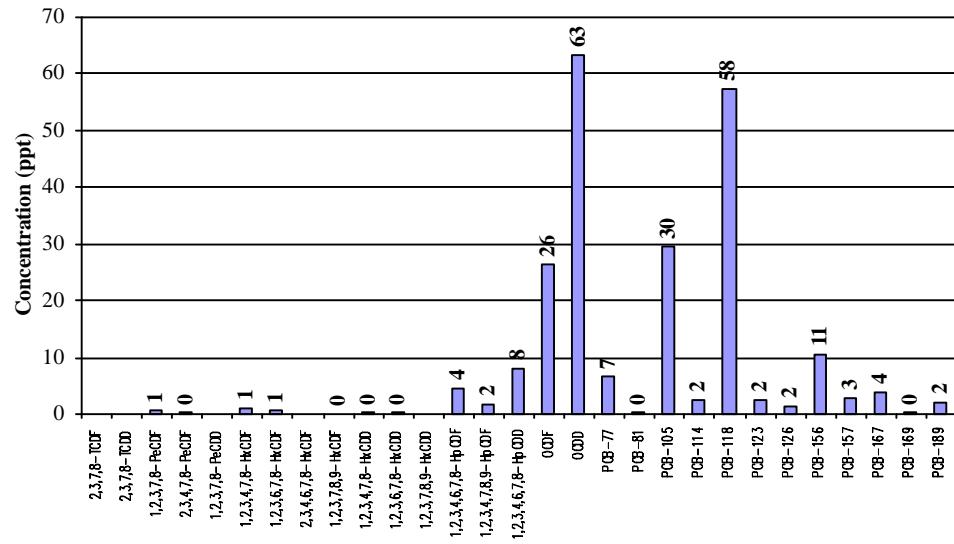
These results were used in congener pattern analysis.

*Sample 641**S3*

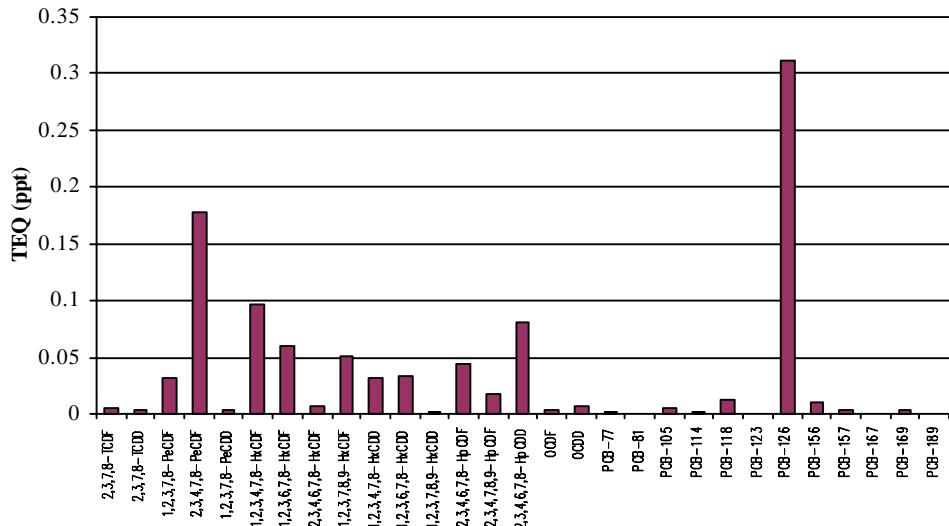
Full Concentrations: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



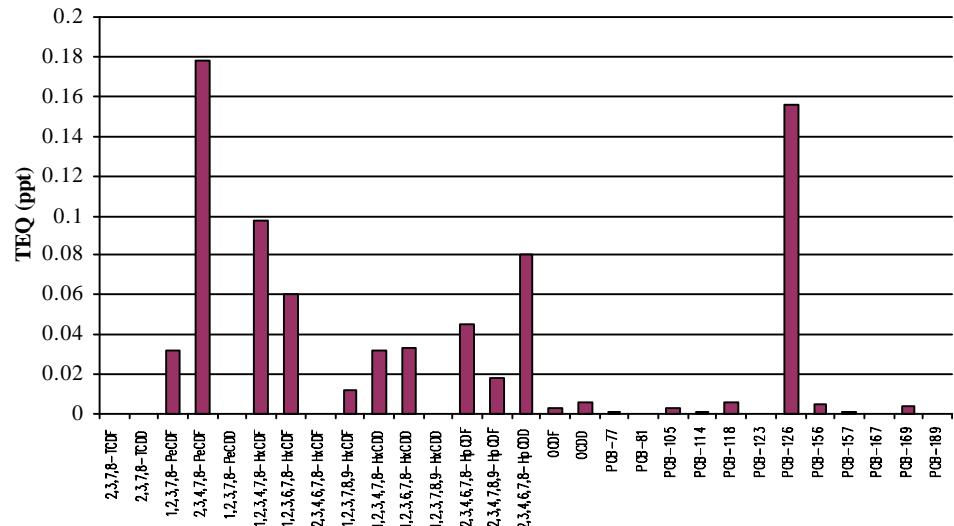
Quantitative Concentrations: Congener Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile
(Quantitative Data Set; Values Greater Than QL)

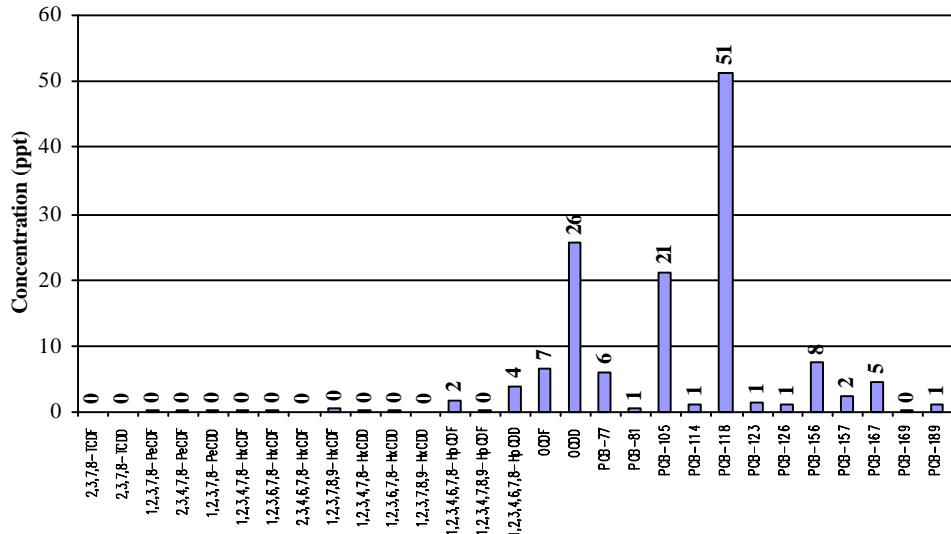


These results were used in congener pattern analysis.

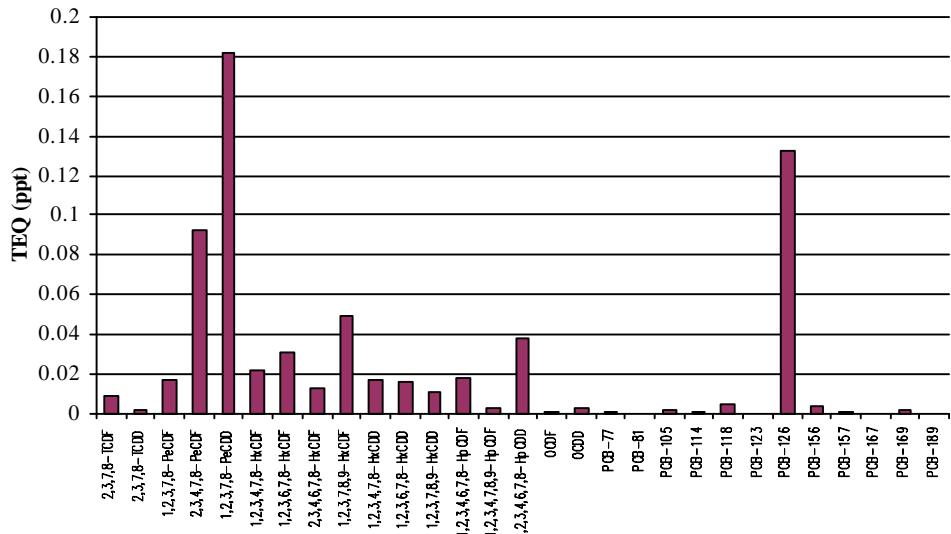
Sample 736

S30

Full Concentrations: Congener Profile (Full Data Set With Proxies = 1/2 DL)

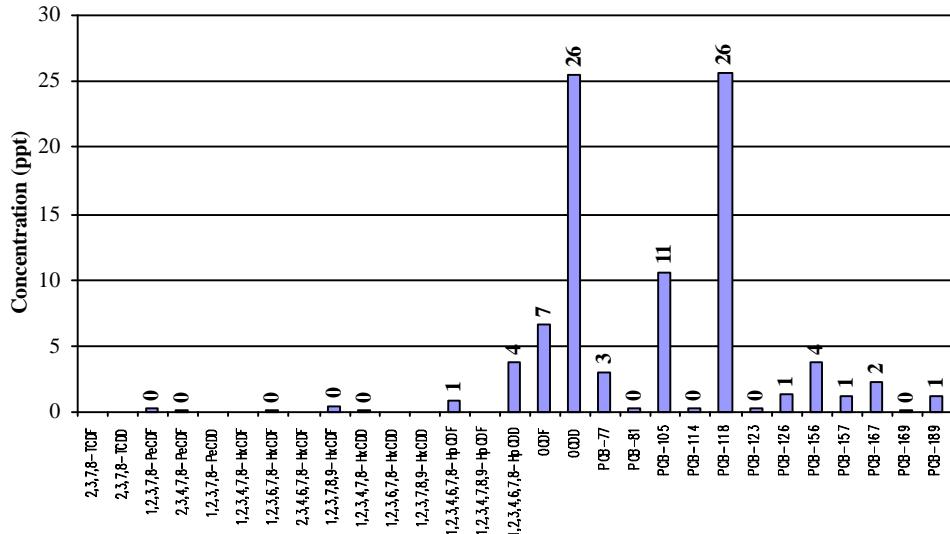


Full TEQs: Congener Profile



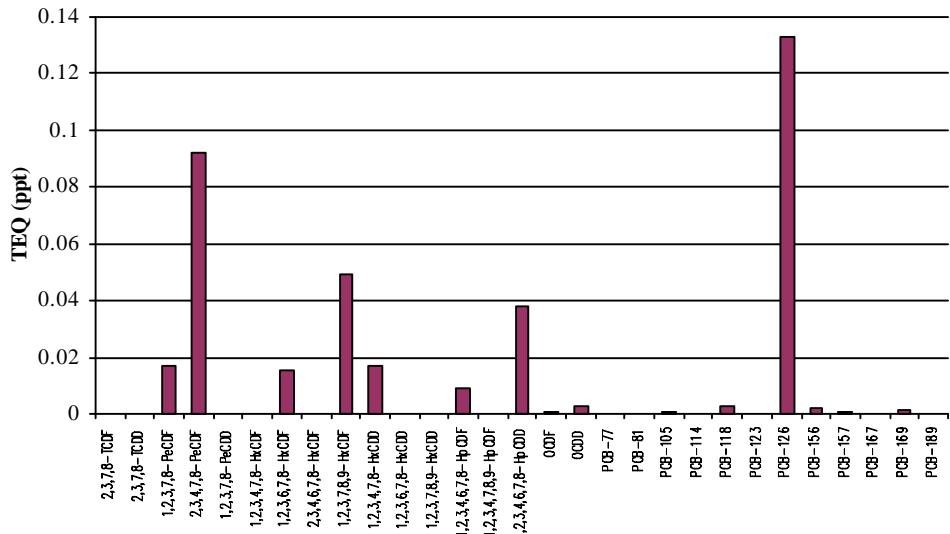
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



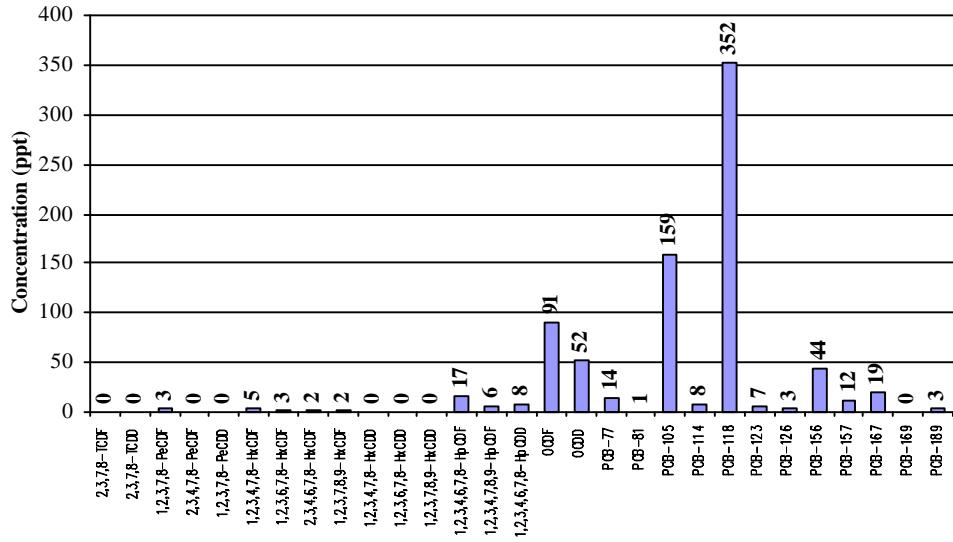
These results were used in congener pattern analysis.

Sample 616

S31

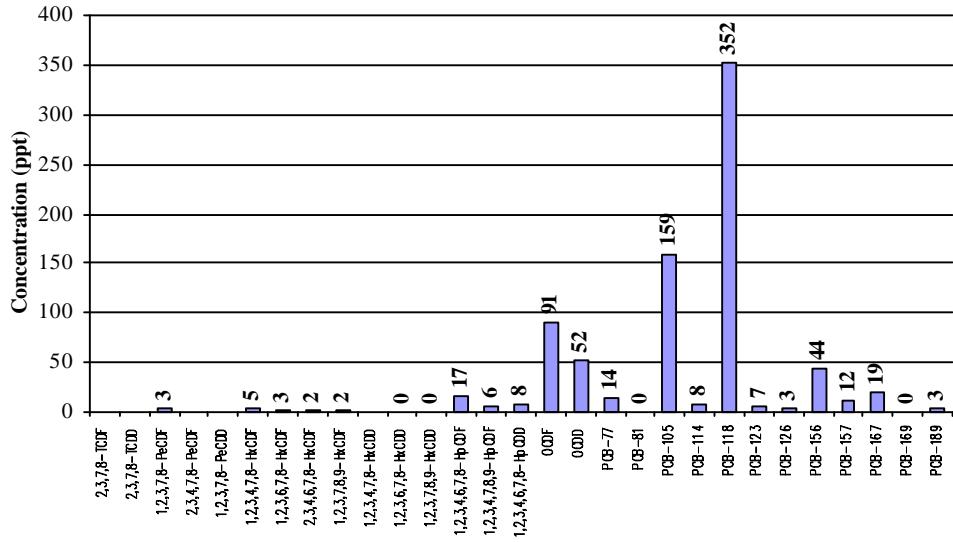
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



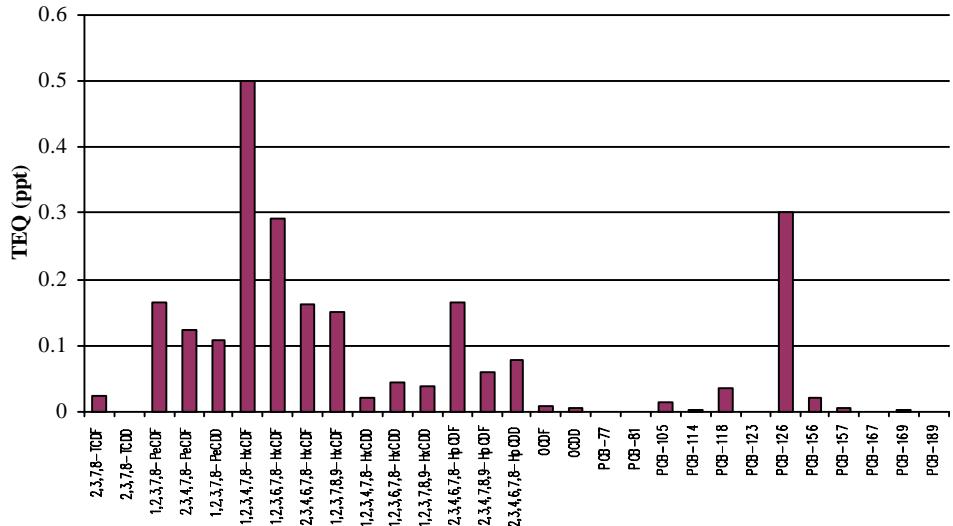
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



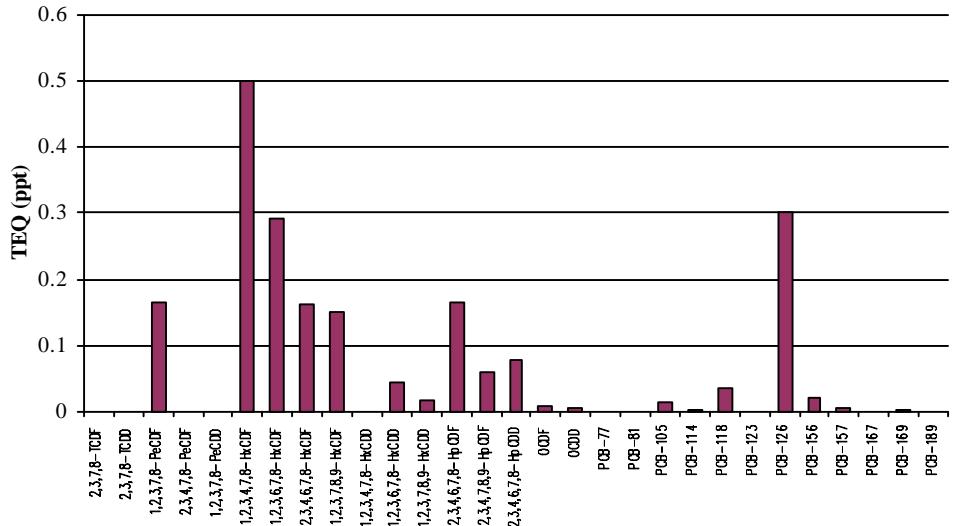
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



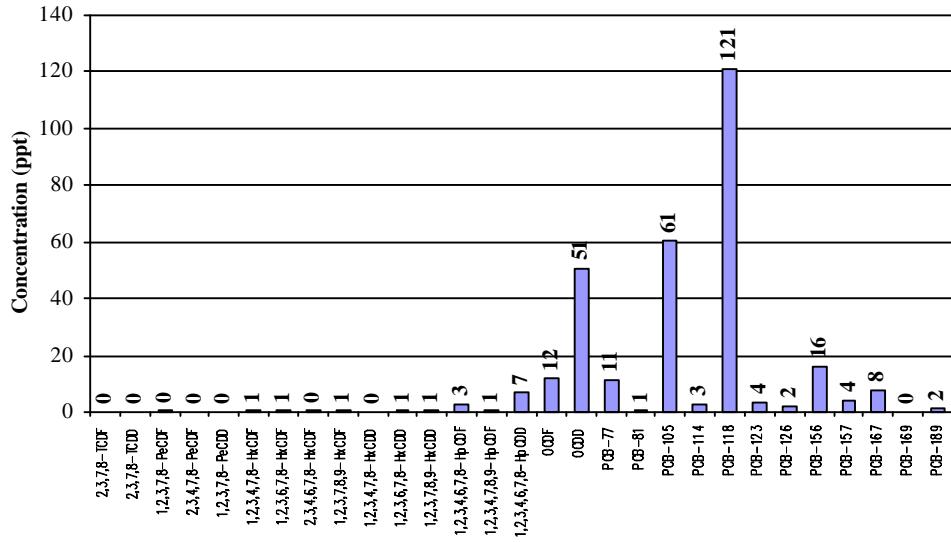
These results were used in congener pattern analysis.

Sample 945

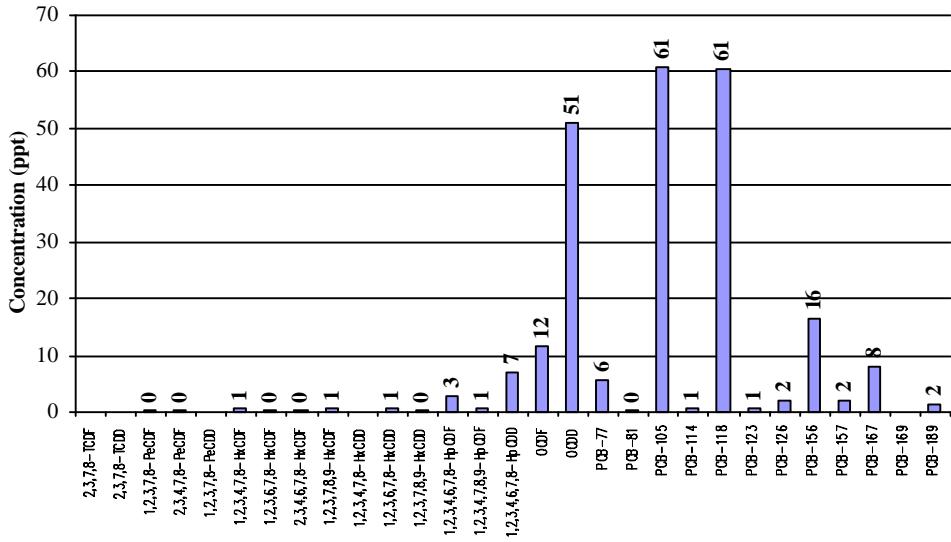
S32

Full Concentrations: Congener Profile

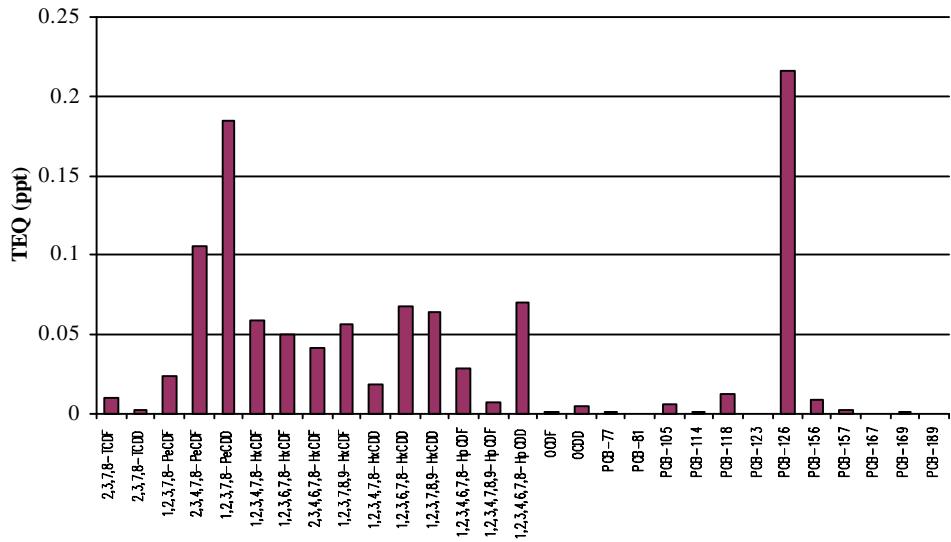
(Full Data Set With Proxies = 1/2 DL)



(Quantitative Data Set; Values Greater Than QL)

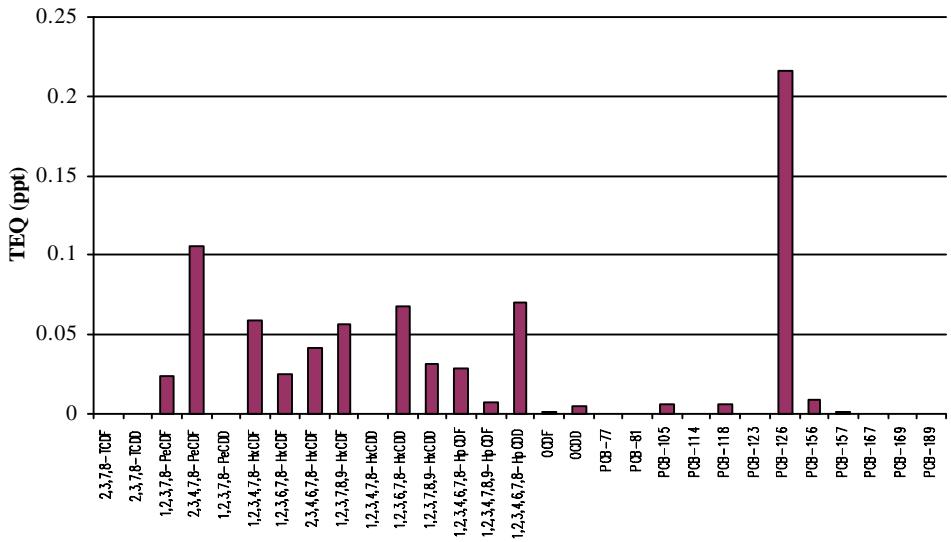


(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



Appendix B1. Congener Profiles

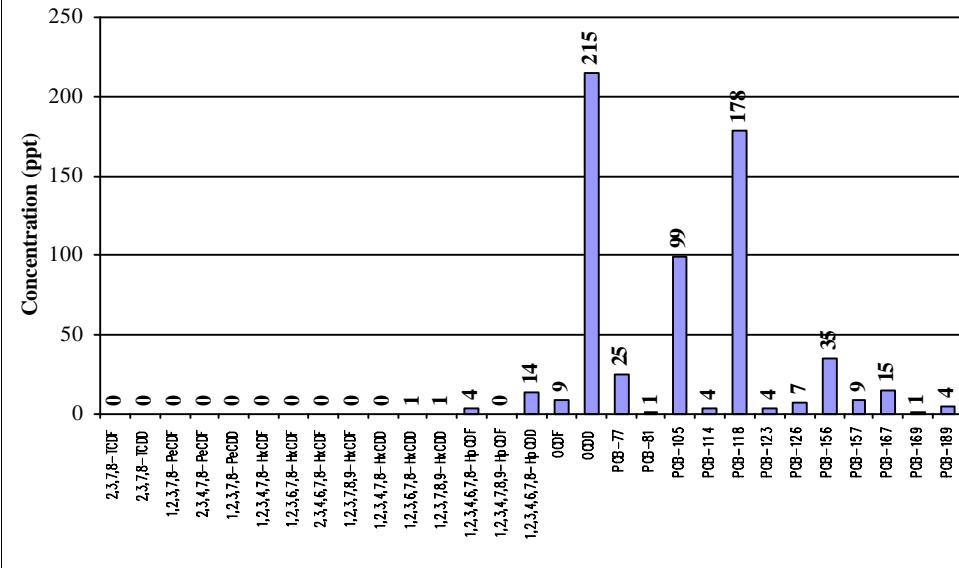
FINAL

These results were used in congener pattern analysis.

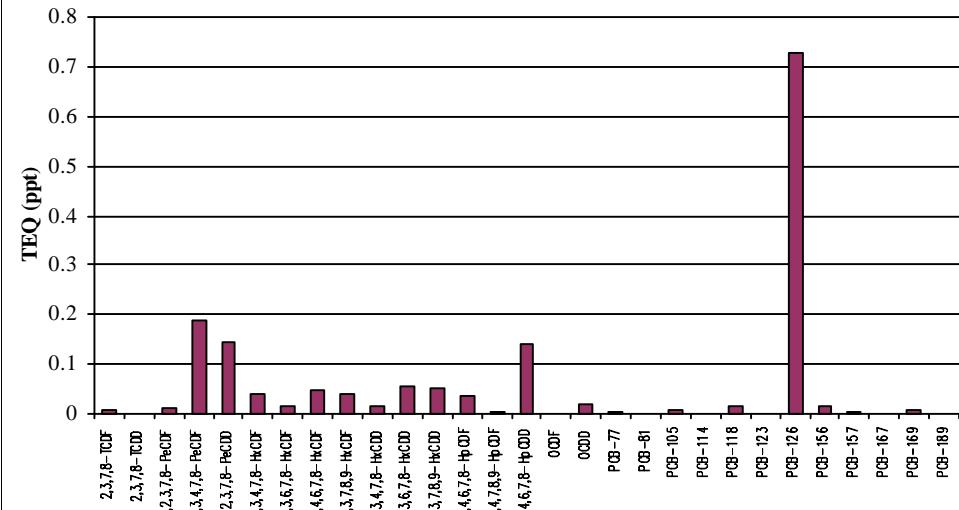
Sample 564

S33

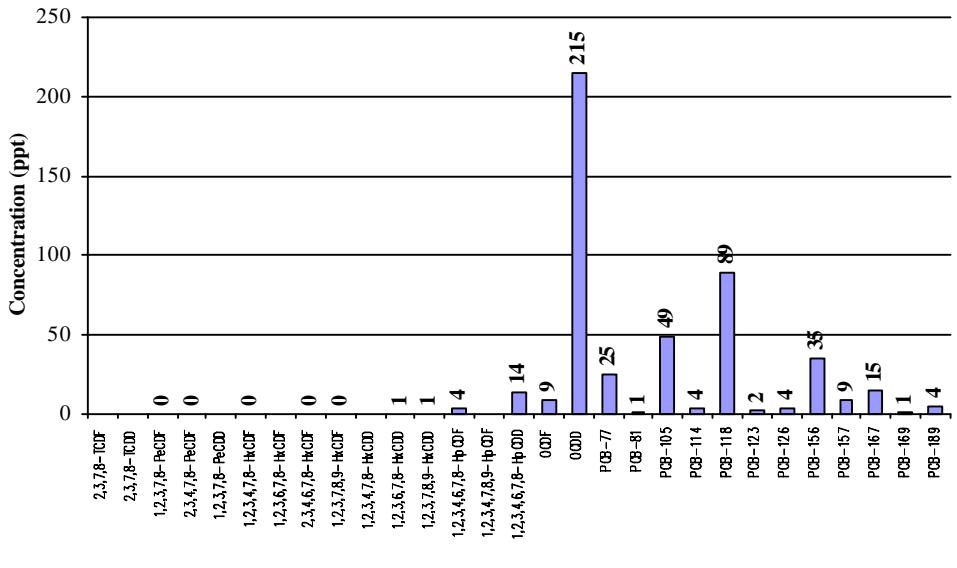
Full Concentrations: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



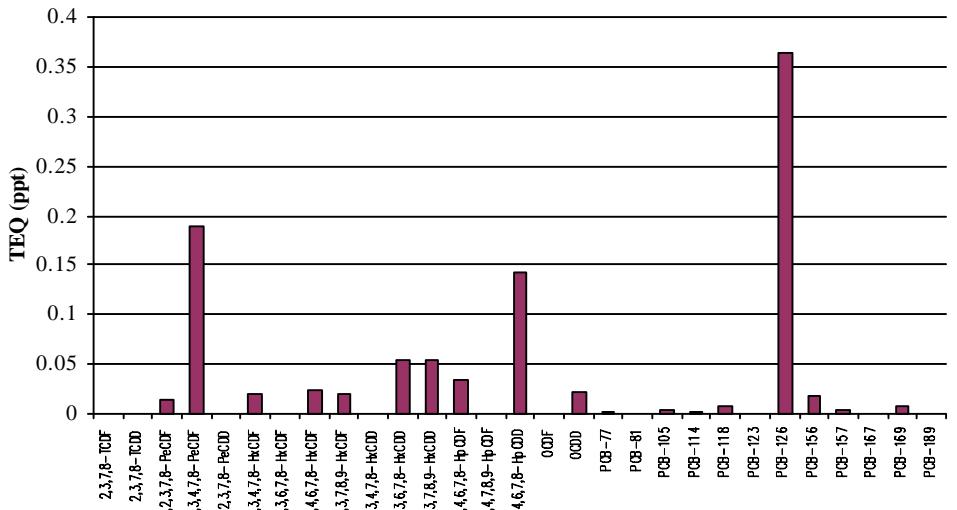
Full TEQs: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative Concentrations: Congener Profile
(Quantitative Data Set; Values Greater Than QL)



Quantitative TEQs: Congener Profile
(Quantitative Data Set; Values Greater Than QL)

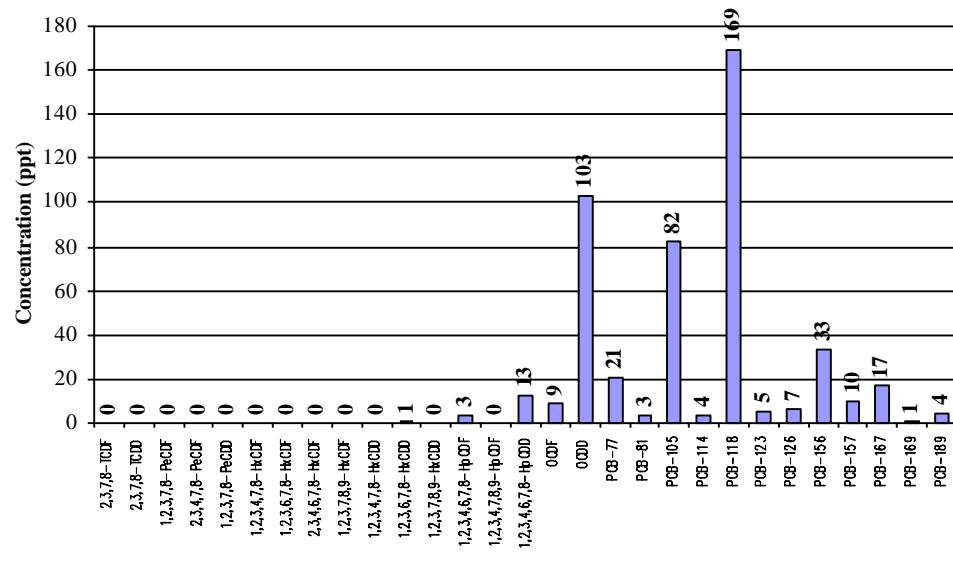


These results were used in congener pattern analysis.

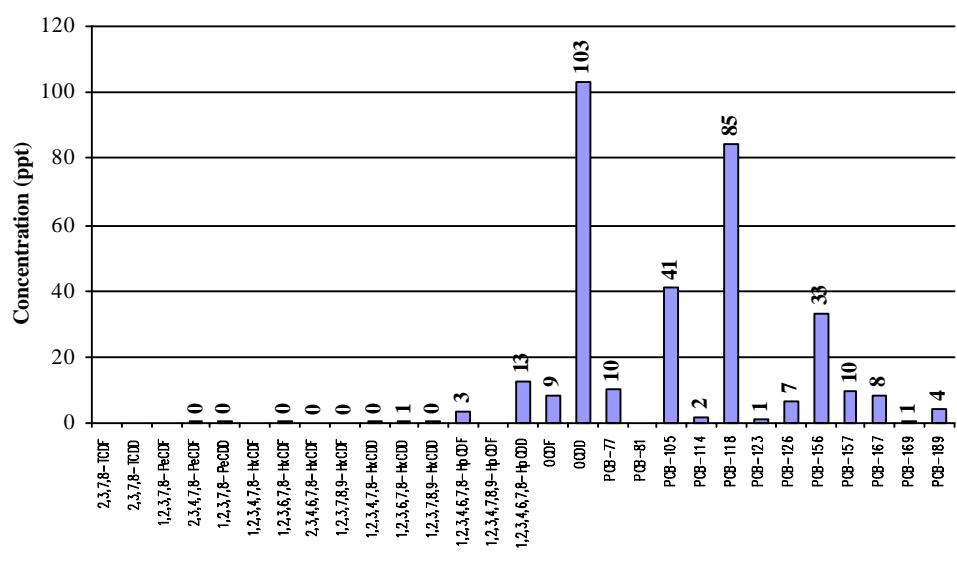
Sample 693

S34

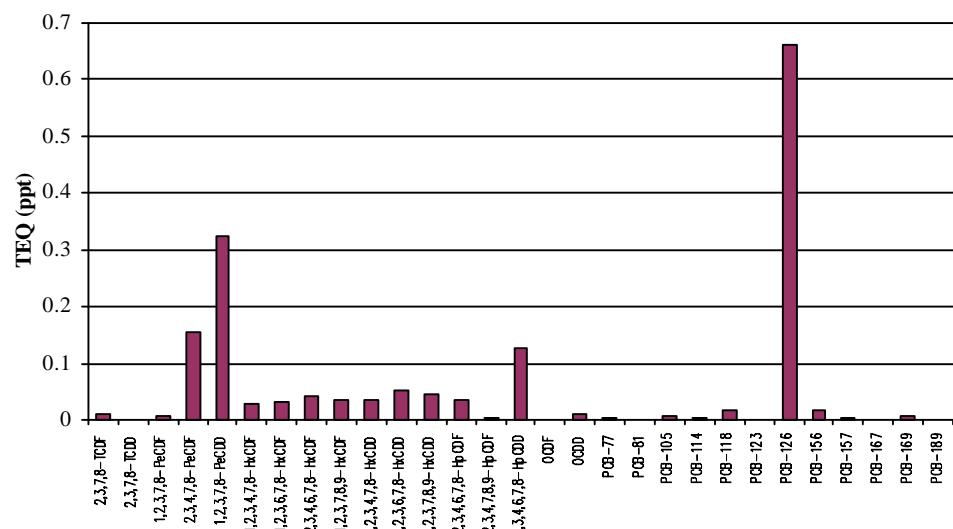
Full Concentrations: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



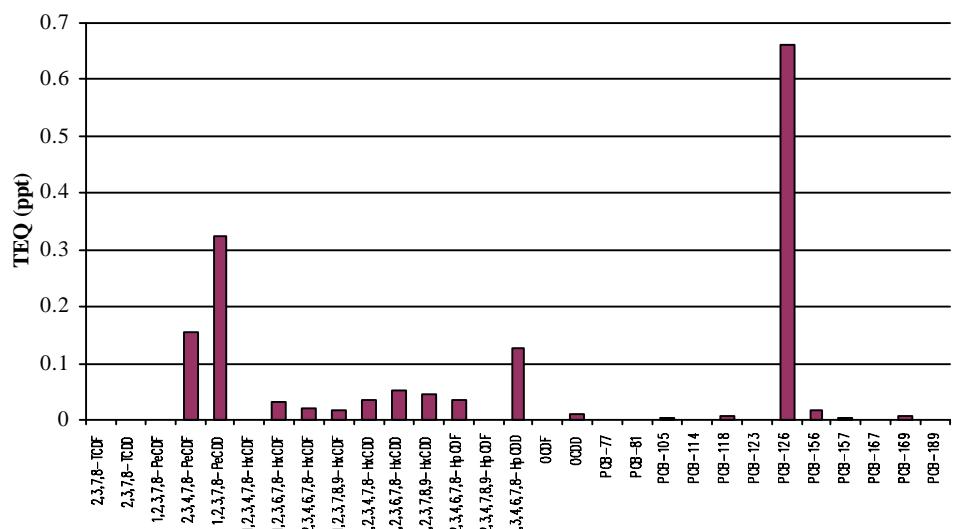
Quantitative Concentrations: Congener Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile
(Quantitative Data Set; Values Greater Than QL)

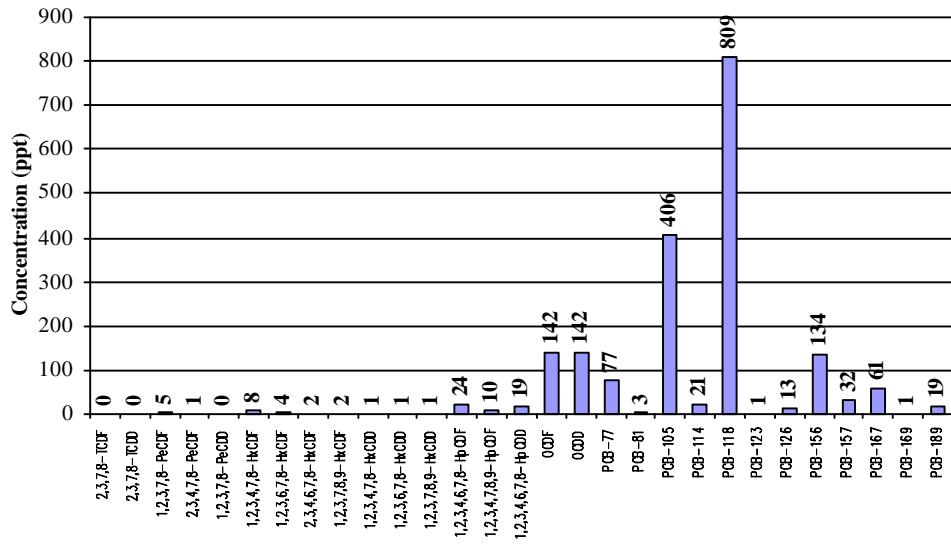


These results were used in congener pattern analysis.

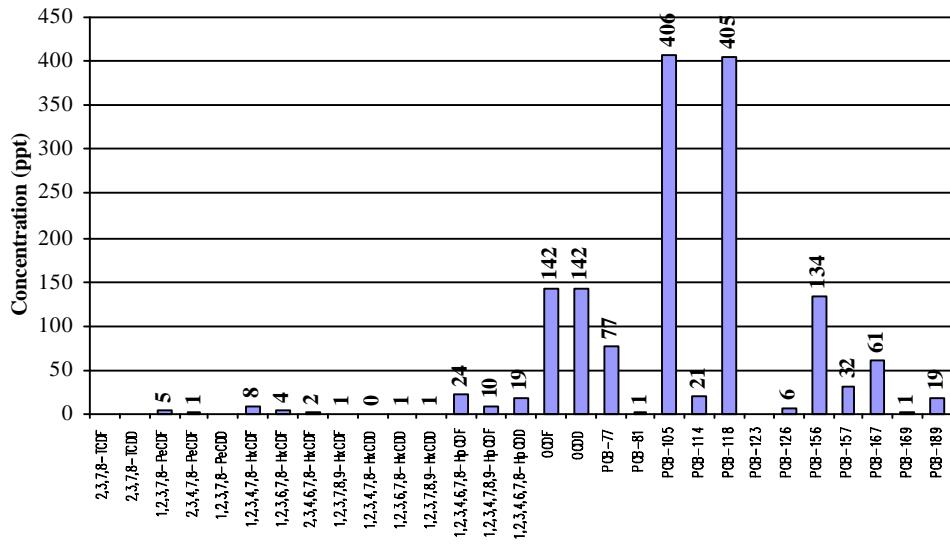
Sample 389

S35

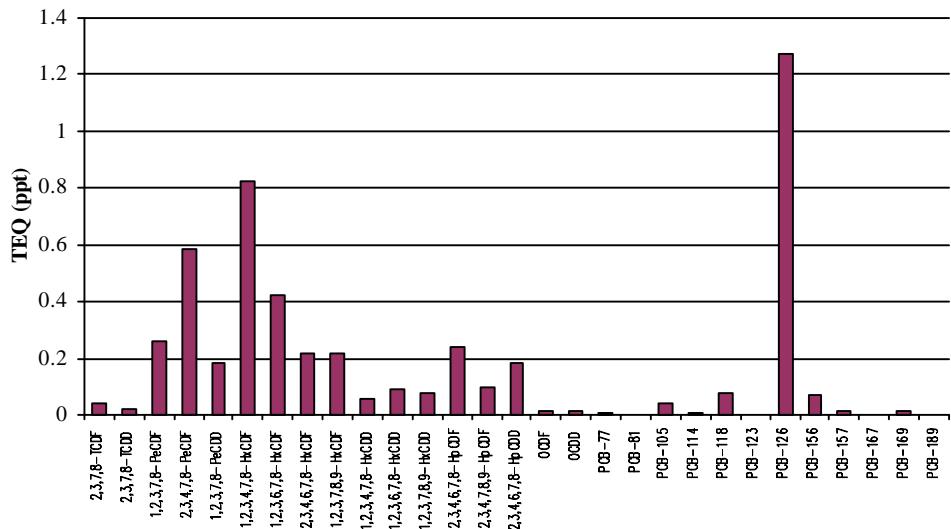
Full Concentrations: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



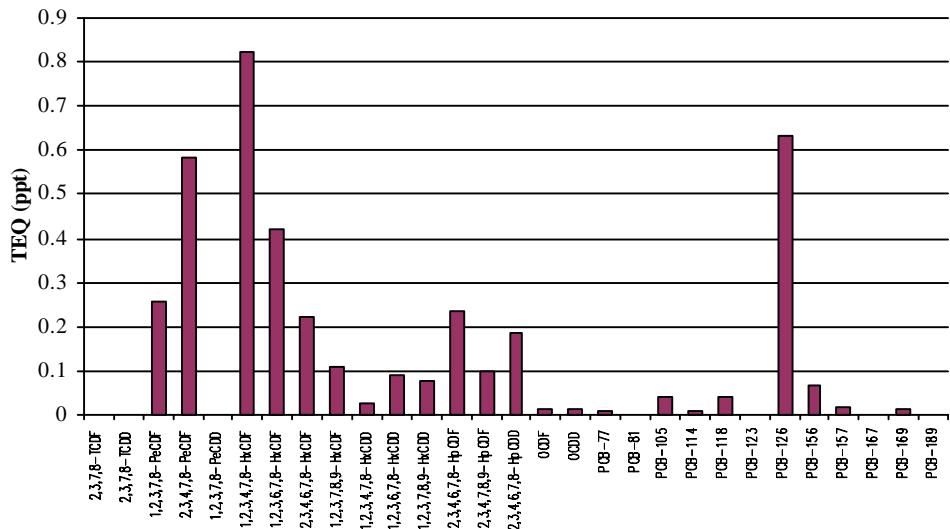
Quantitative Concentrations: Congener Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Congener Profile
(Full Data Set With Proxies = 1/2 DL)

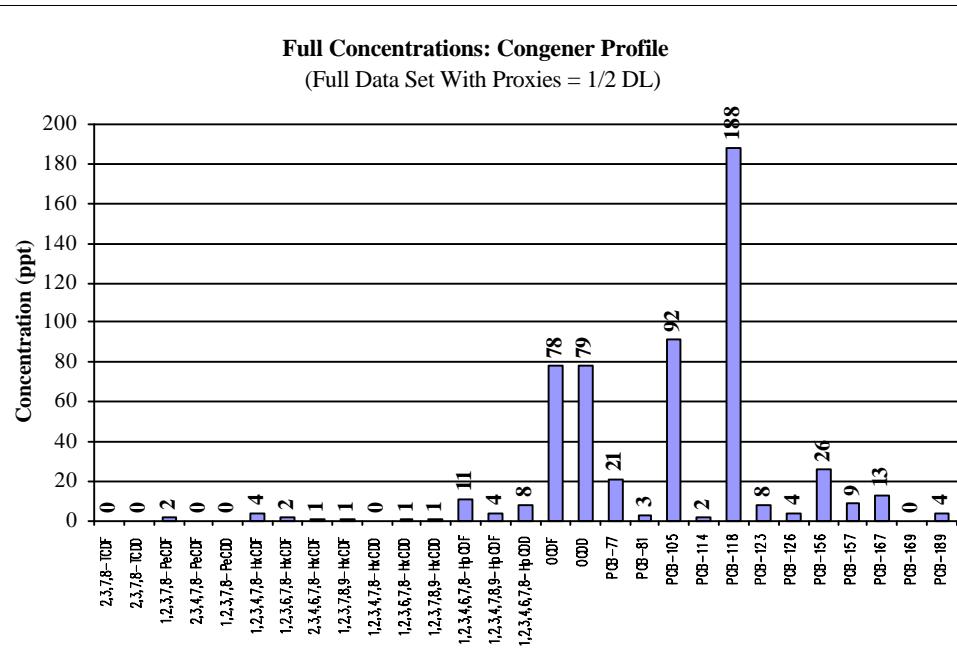


Quantitative TEQs: Congener Profile
(Quantitative Data Set; Values Greater Than QL)

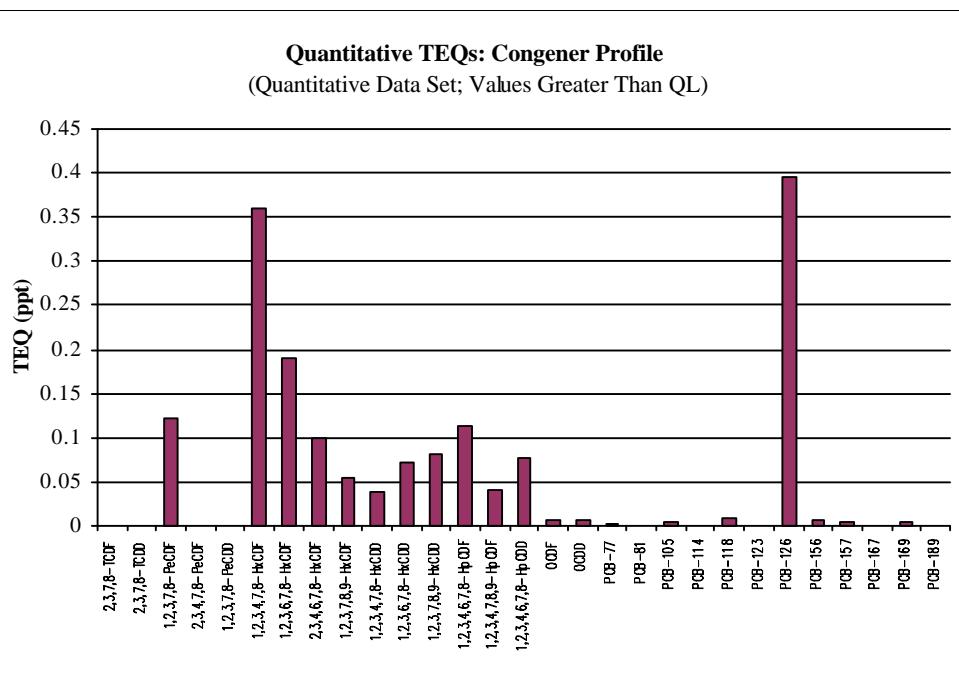
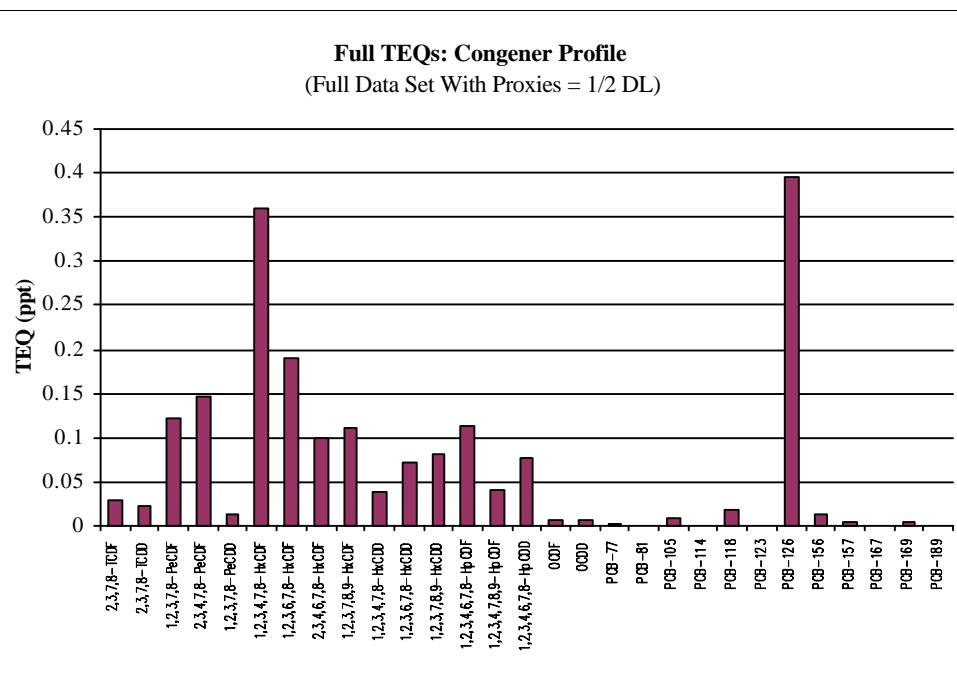
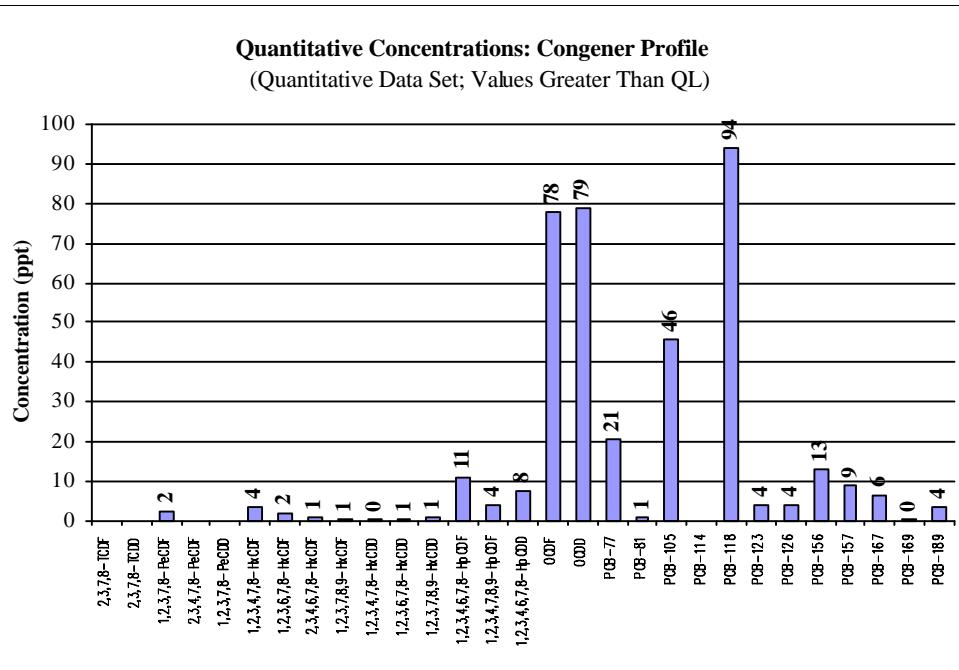


These results were used in congener pattern analysis.

Sample 991



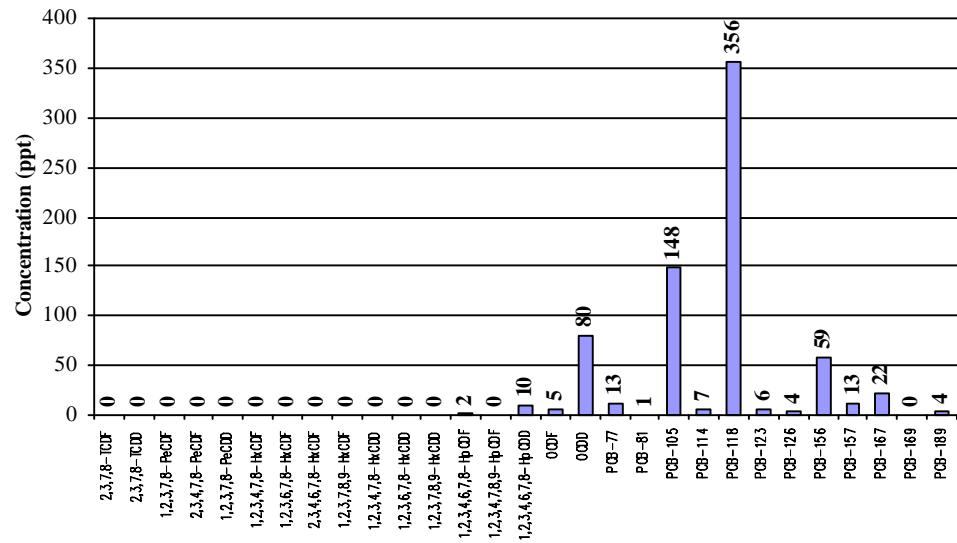
S36



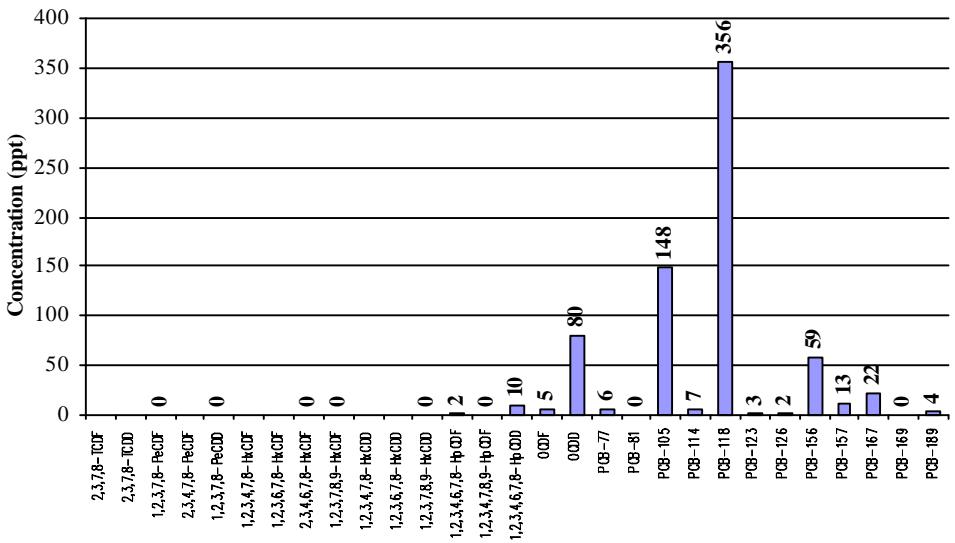
These results were used in congener pattern analysis.

Sample 102**S4**

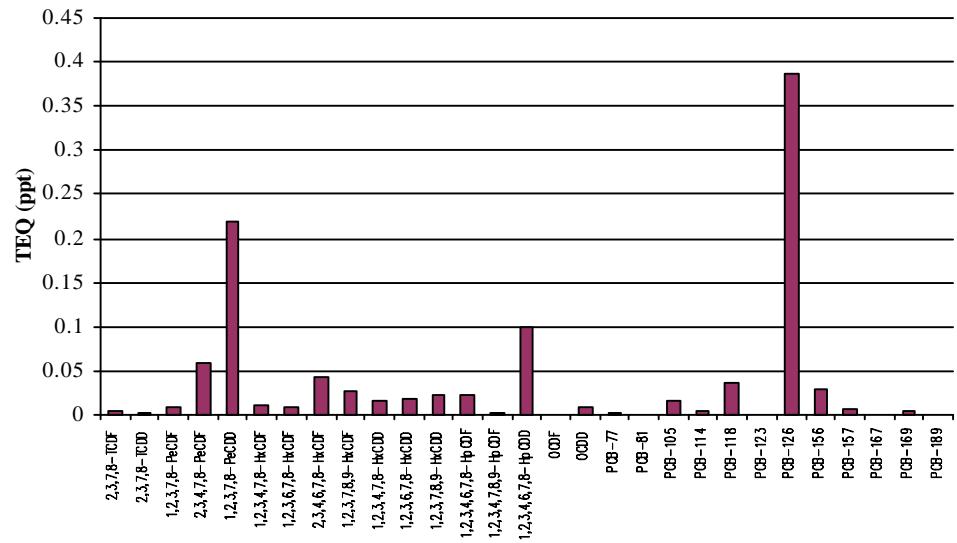
Full Concentrations: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



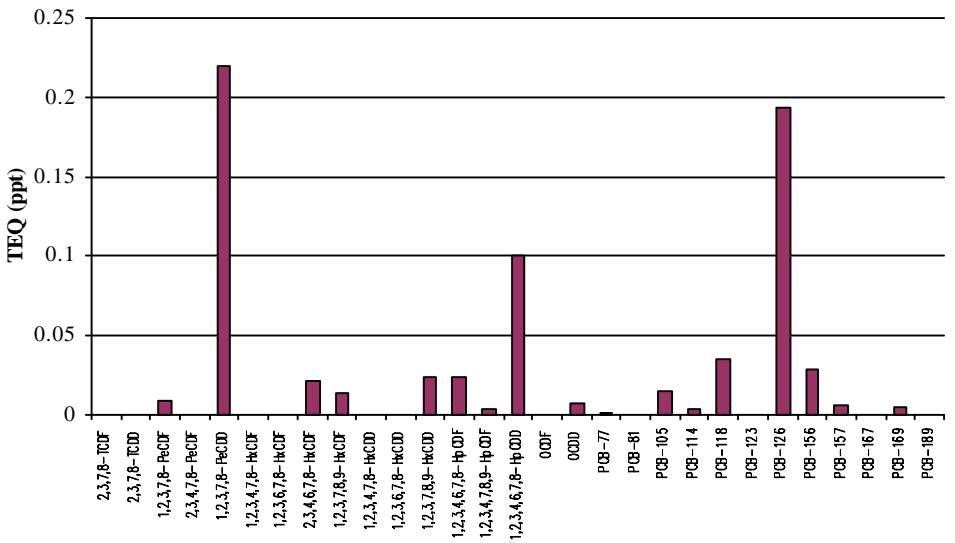
Quantitative Concentrations: Congener Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Congener Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile
(Quantitative Data Set; Values Greater Than QL)

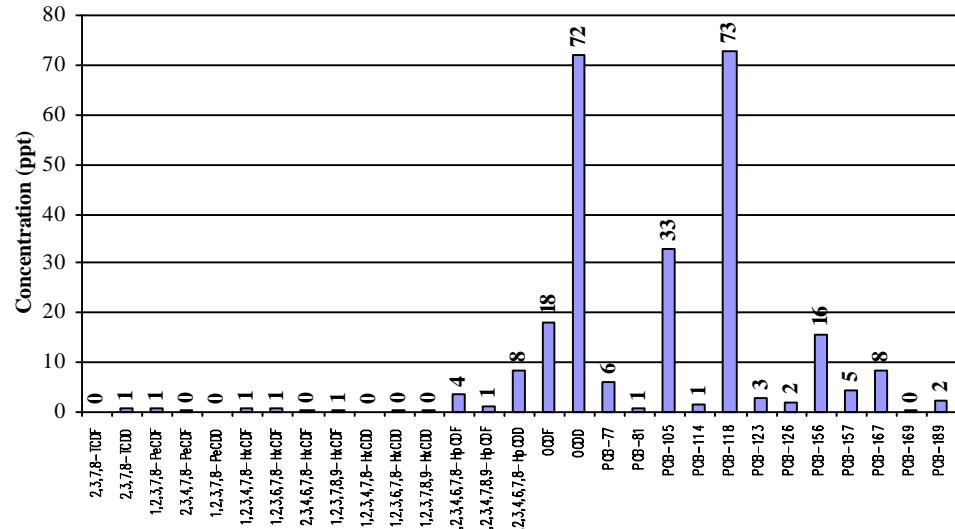


Appendix B1. Congener Profiles

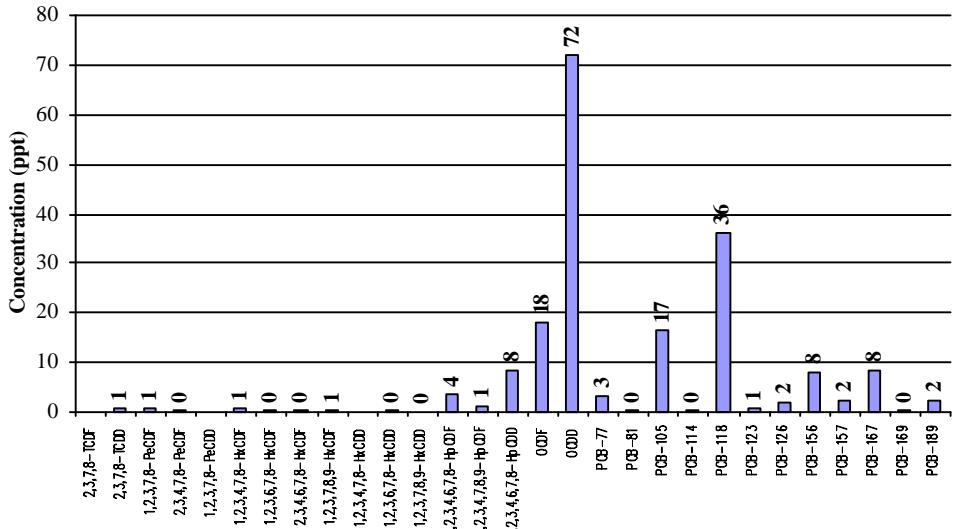
These results were used in congener pattern analysis.

*Sample 234**S5***Full Concentrations: Congener Profile**

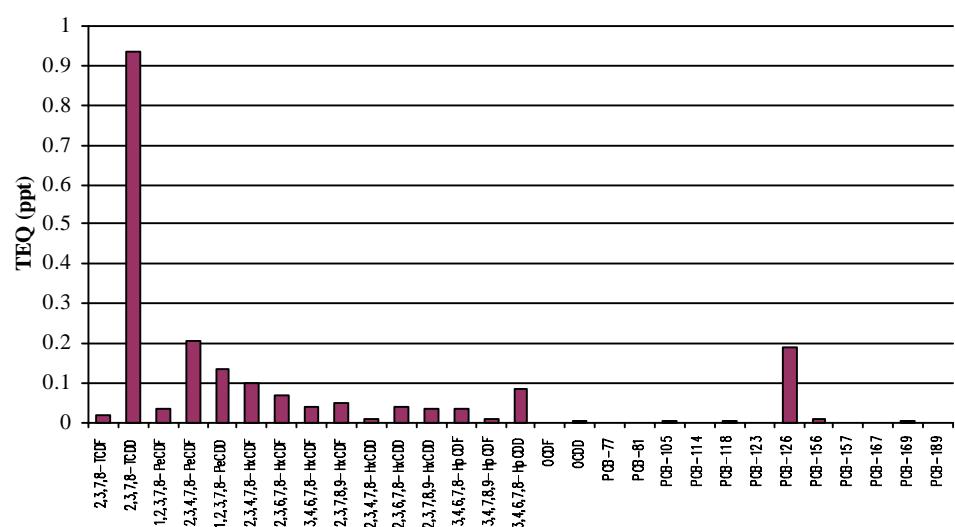
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

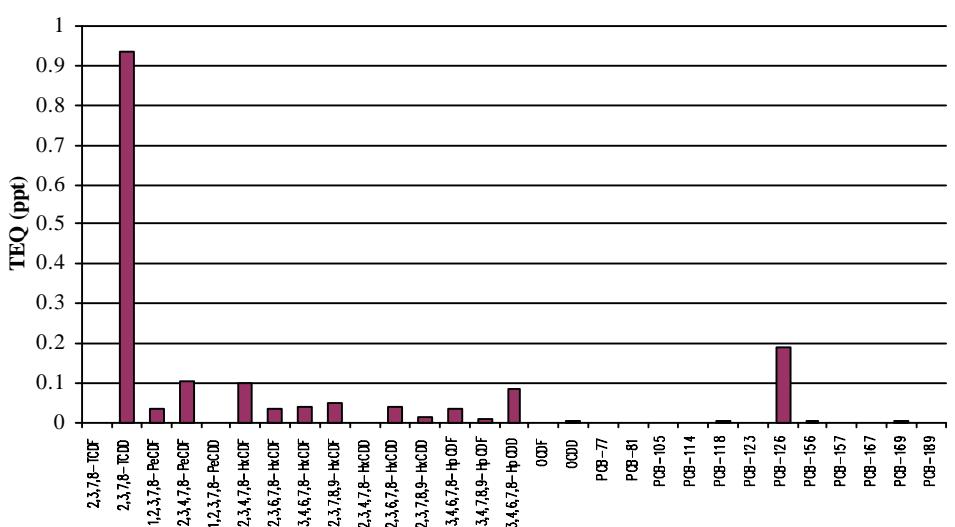
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

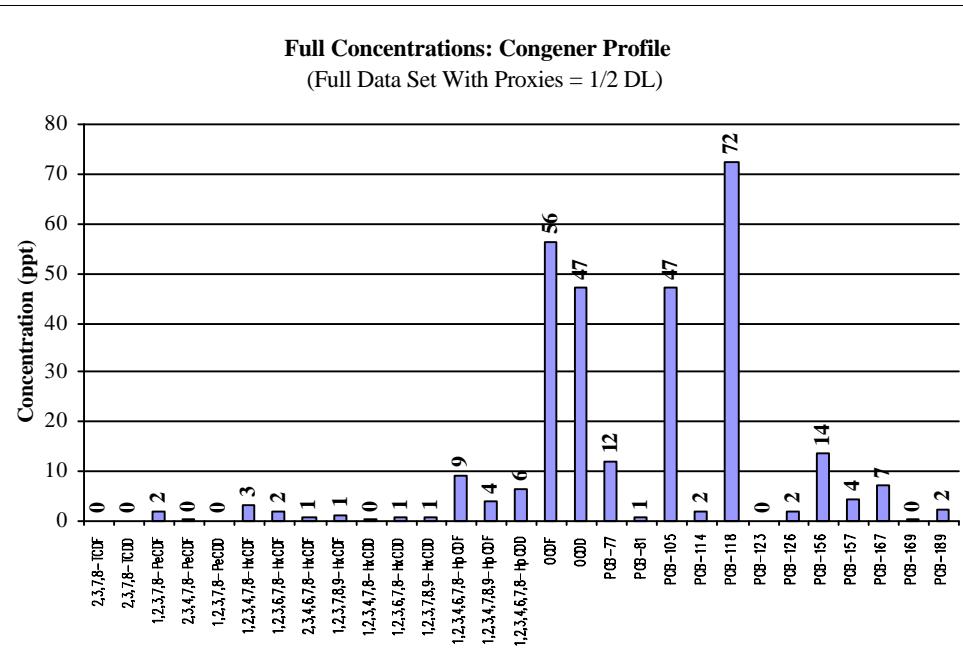
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

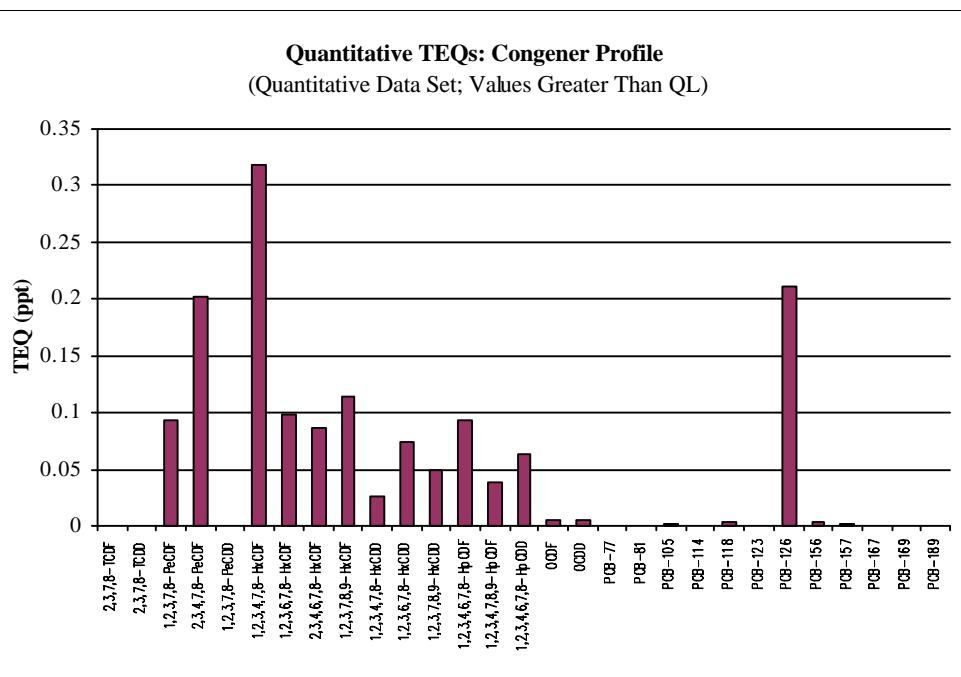
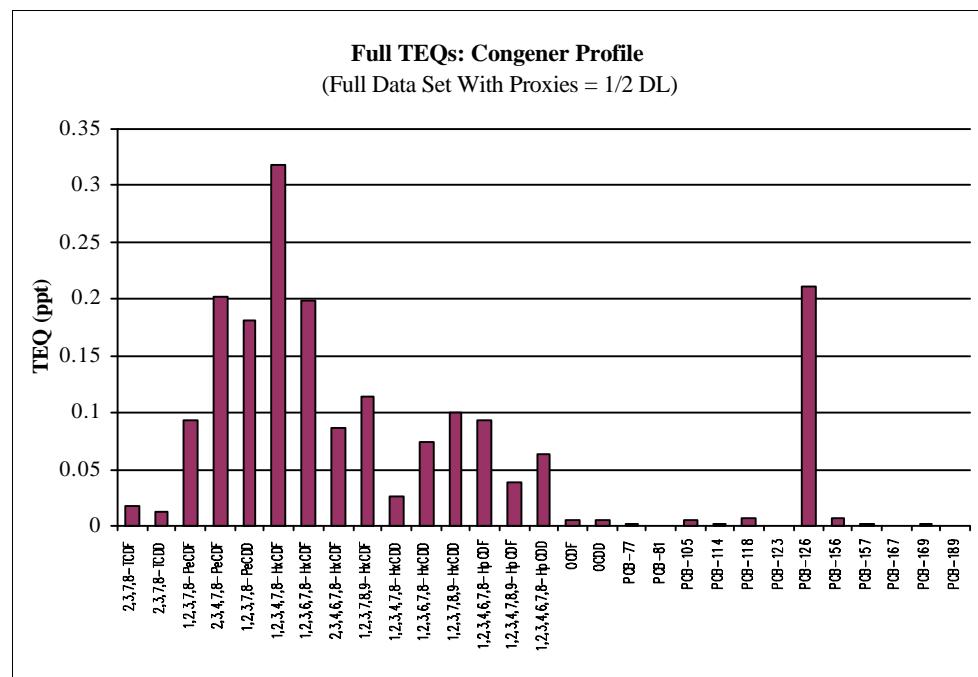
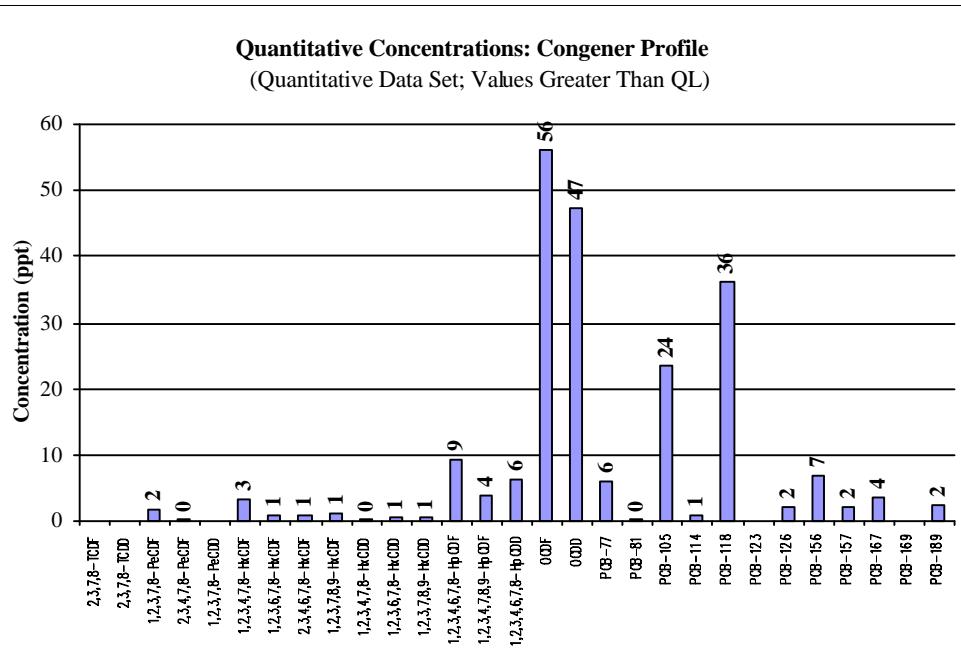


These results were used in congener pattern analysis.

Sample 830



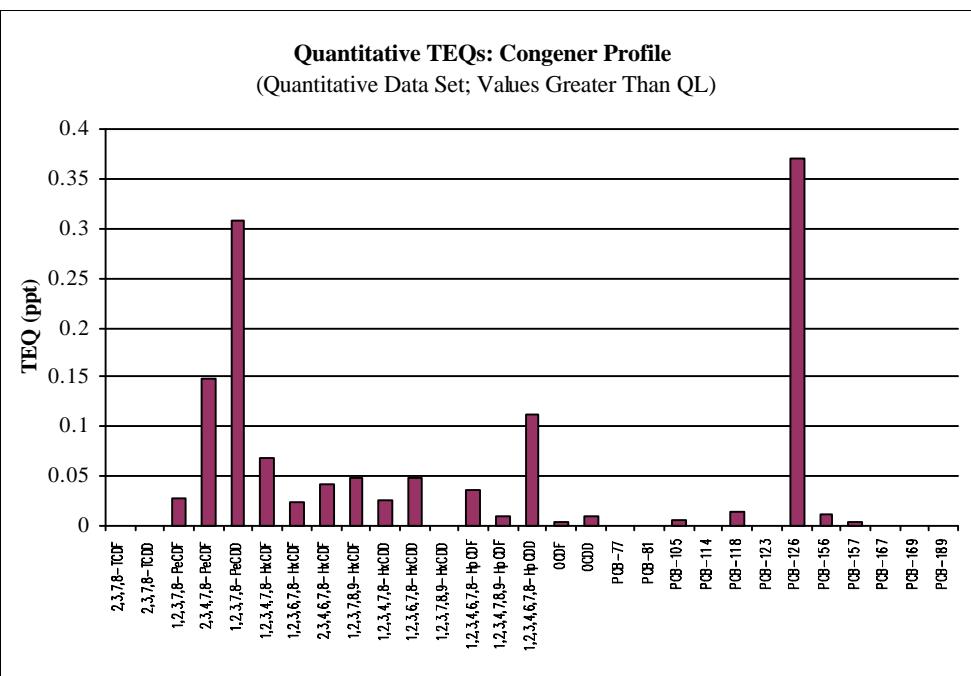
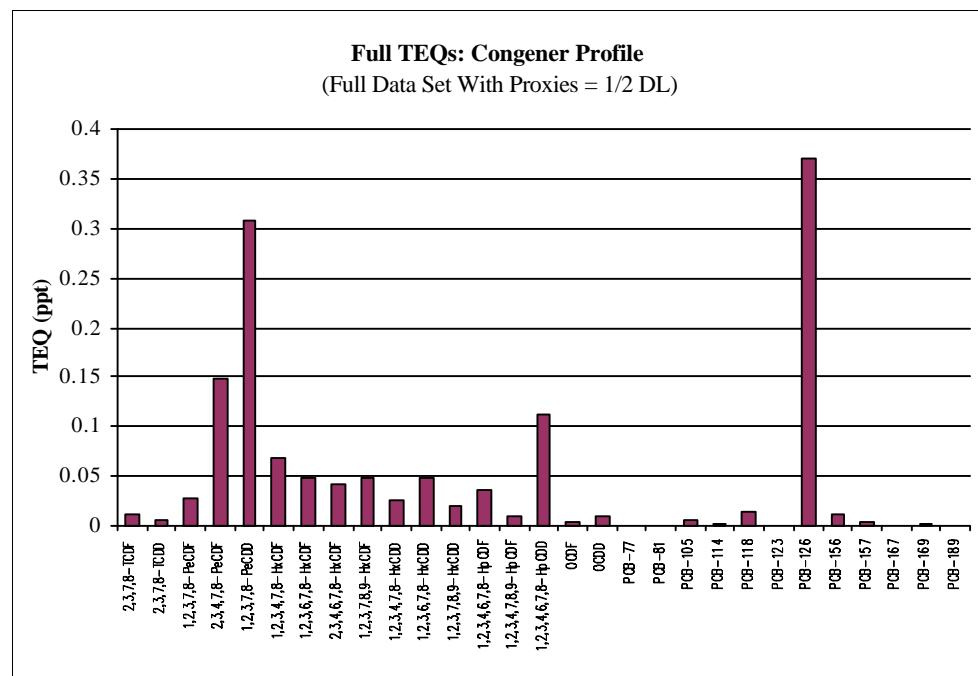
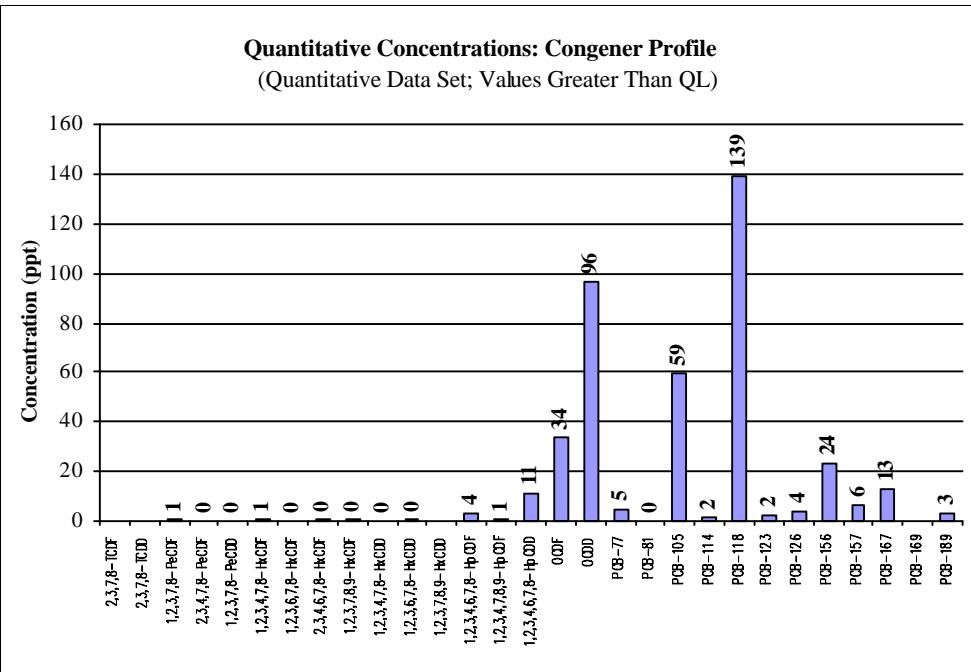
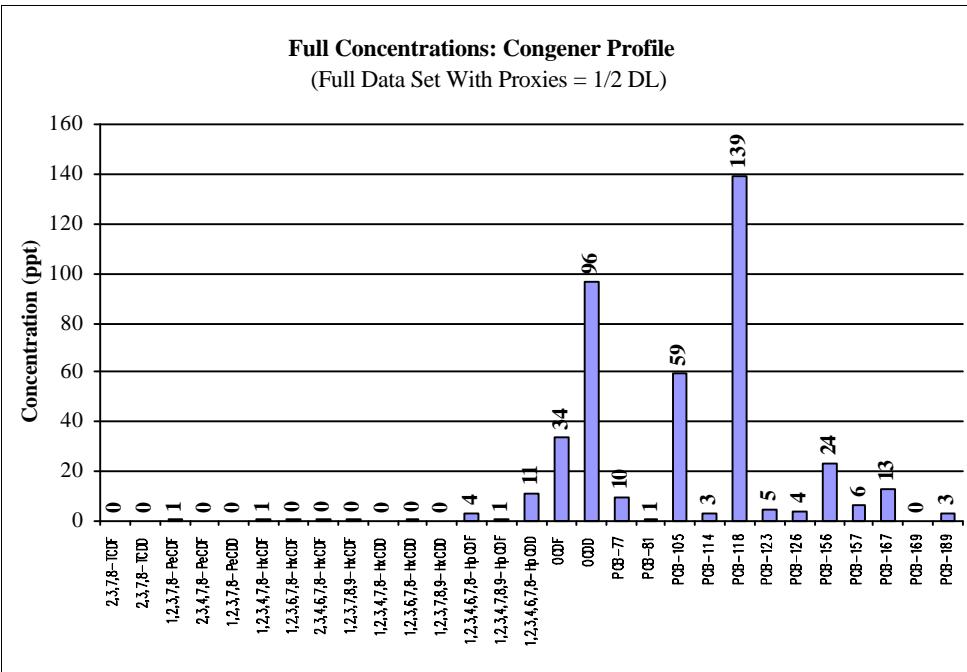
S6



These results were used in congener pattern analysis.

Sample 788

S7

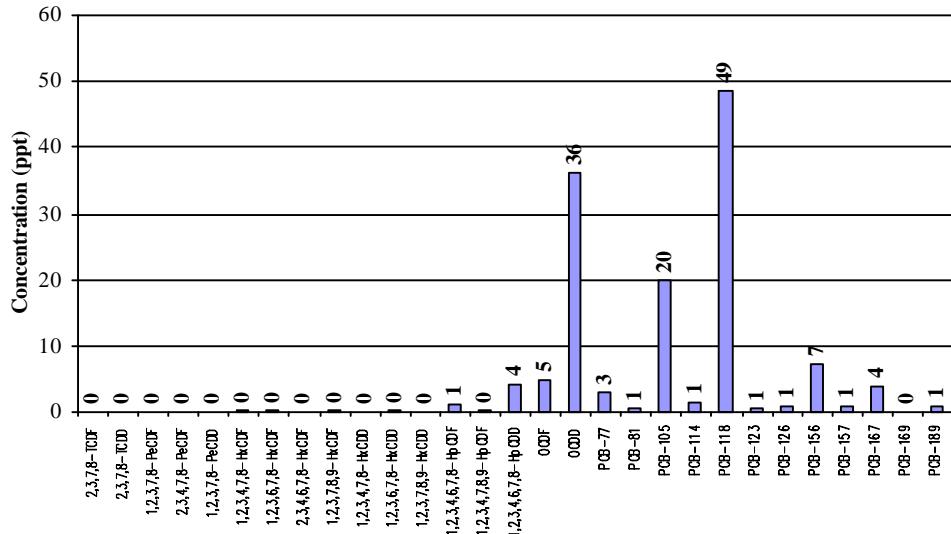


These results were used in congener pattern analysis.

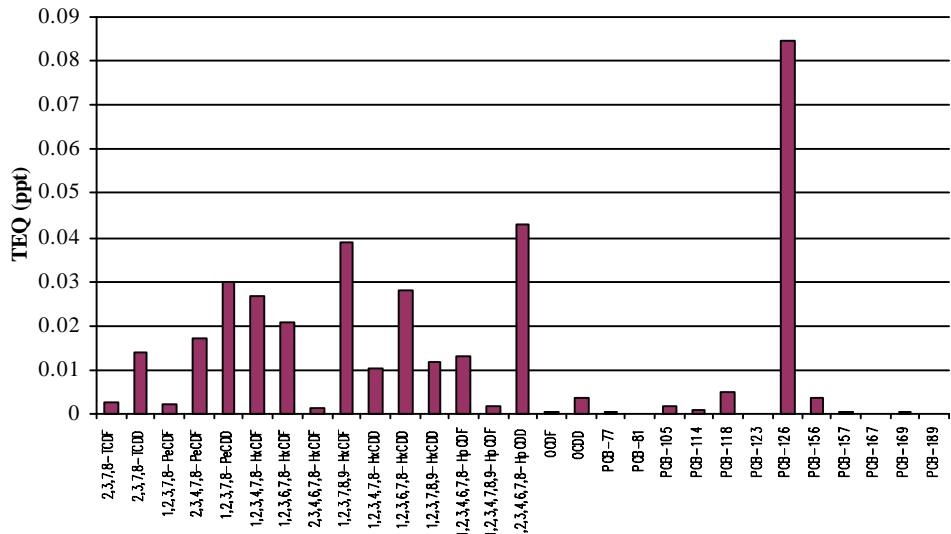
Sample 589

S8

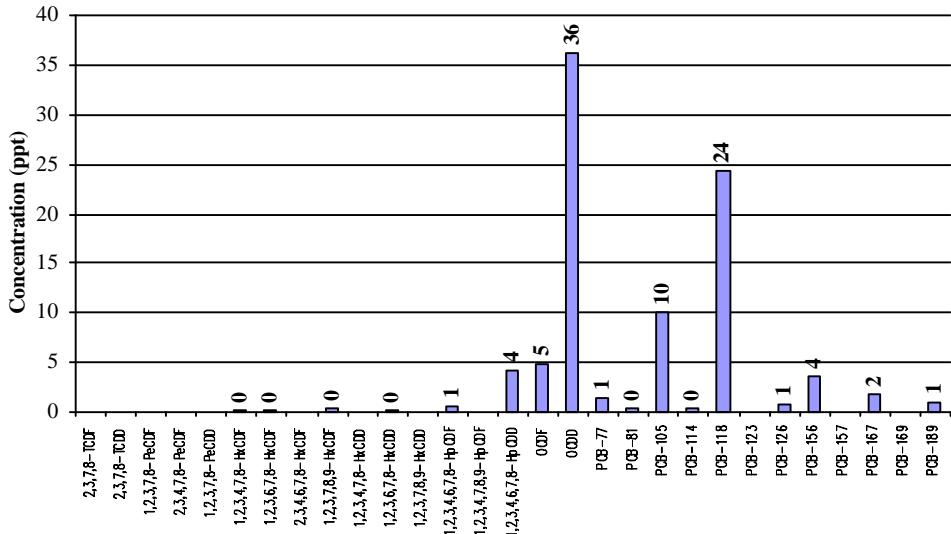
Full Concentrations: Congener Profile (Full Data Set With Proxies = 1/2 DL)



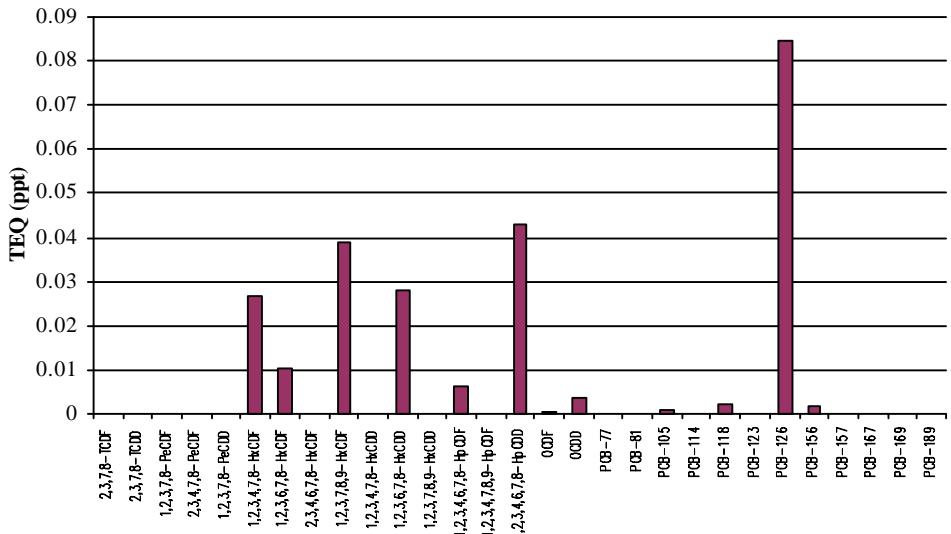
Full TEQs: Congener Profile



Quantitative Concentrations: Congener Profile



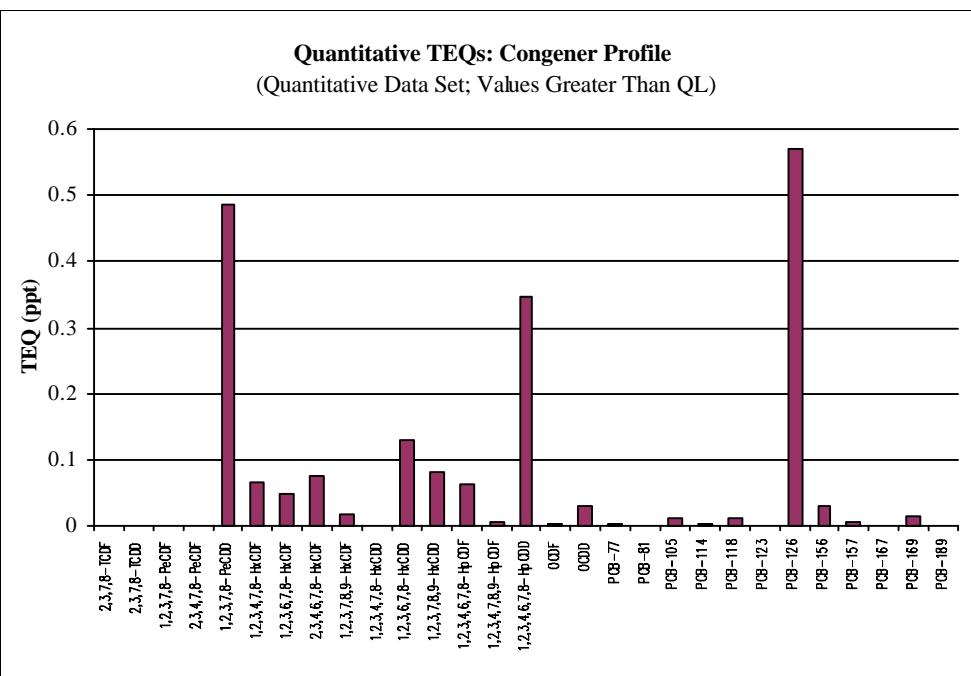
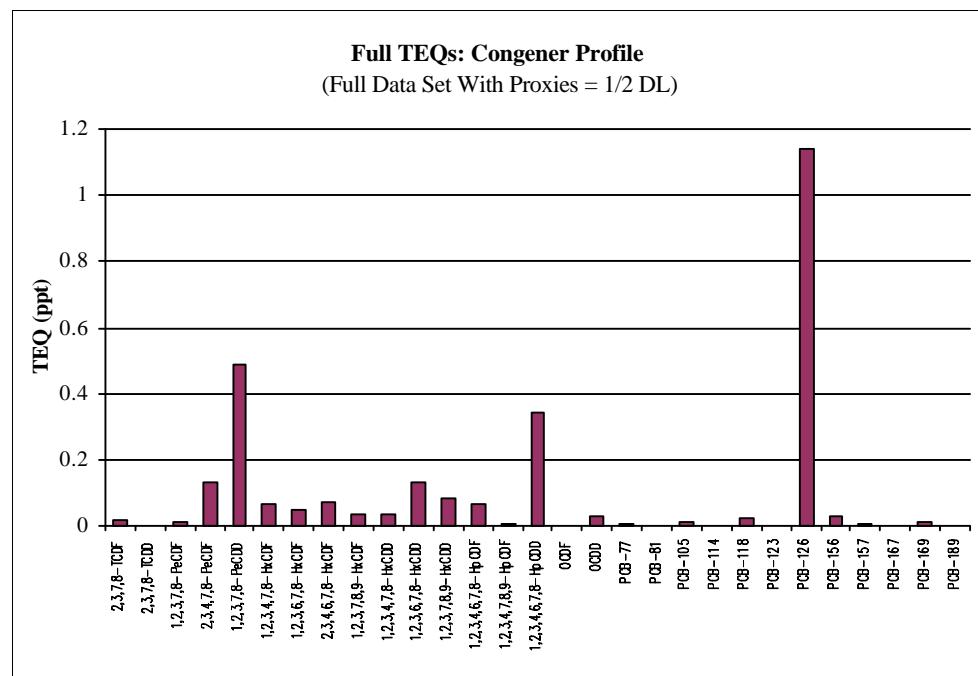
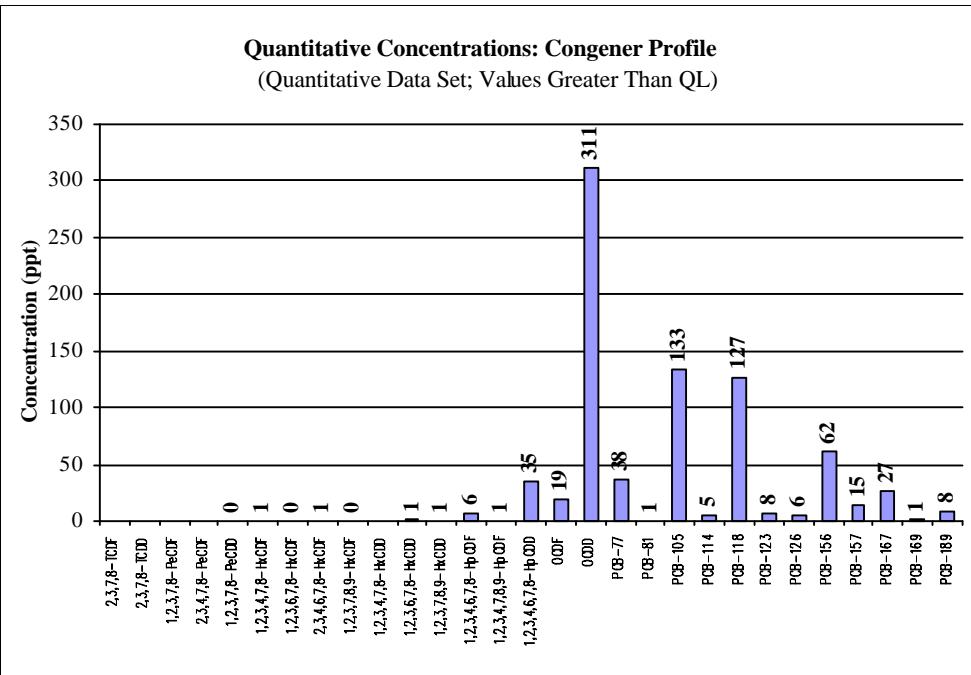
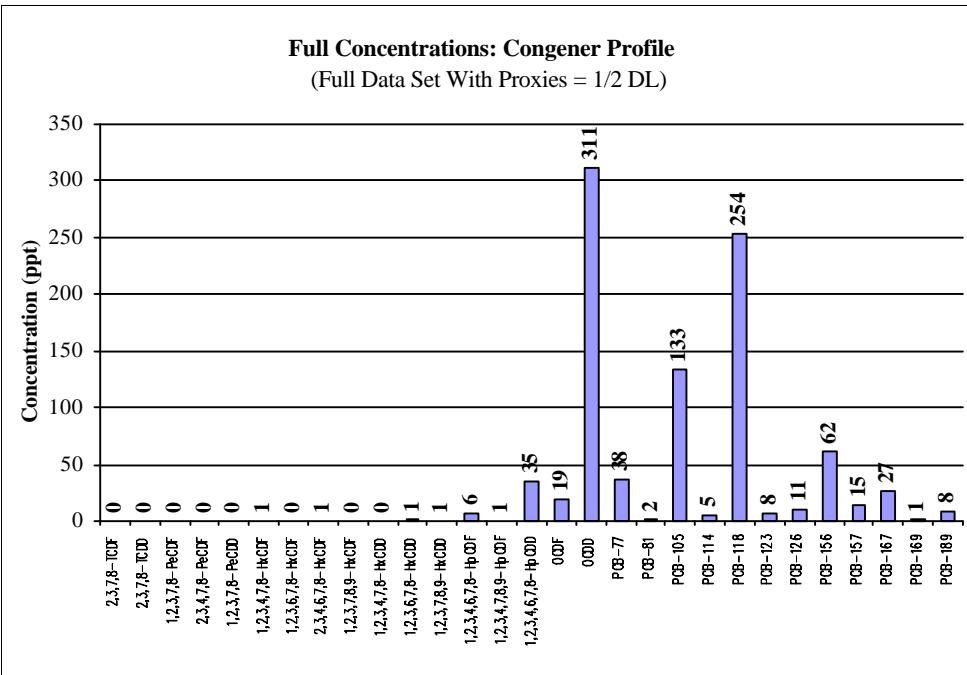
Quantitative TEQs: Congener Profile



These results were used in congener pattern analysis.

Sample 249

S9

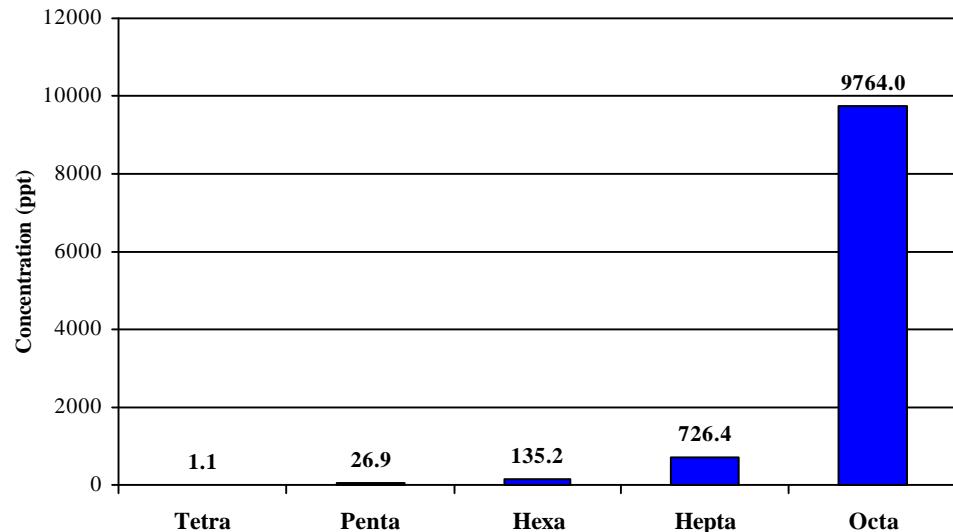


Appendix B2. Homologue Profiles

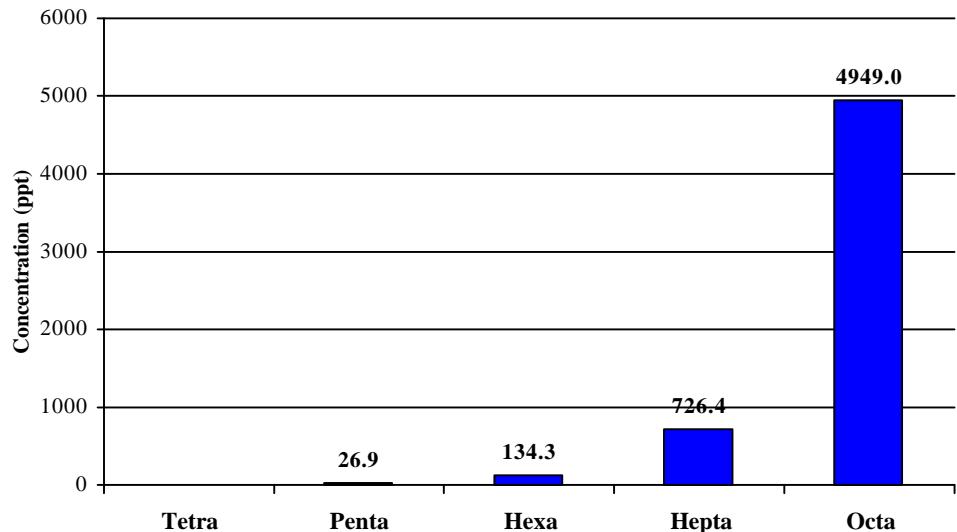
Sample 463

SI

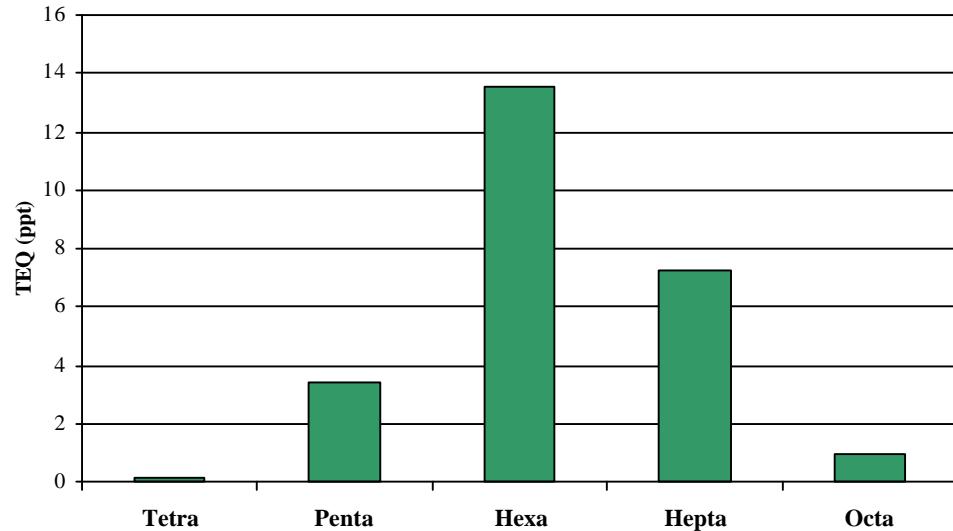
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



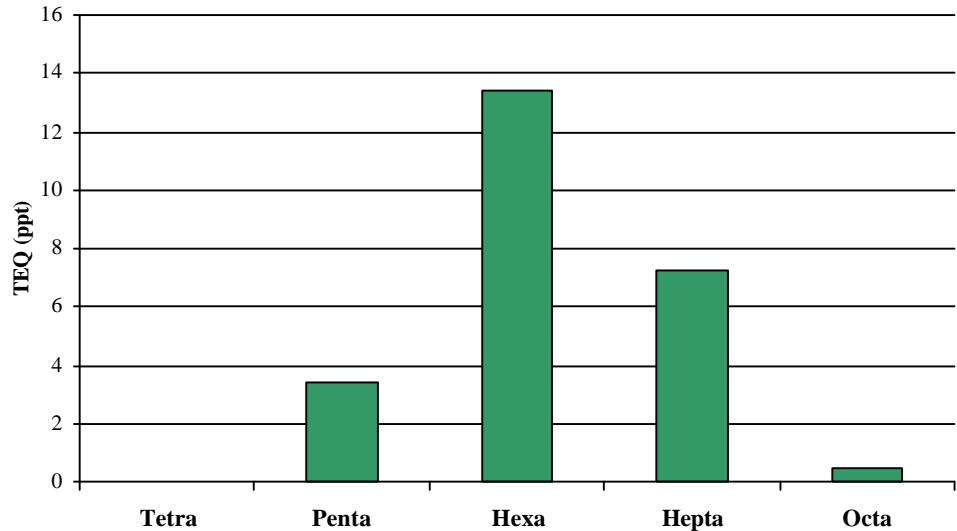
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)

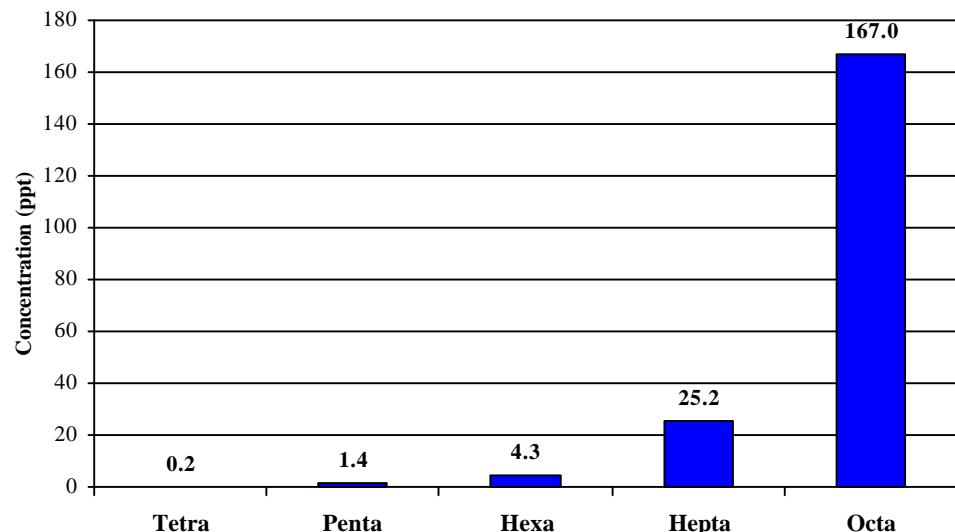


Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

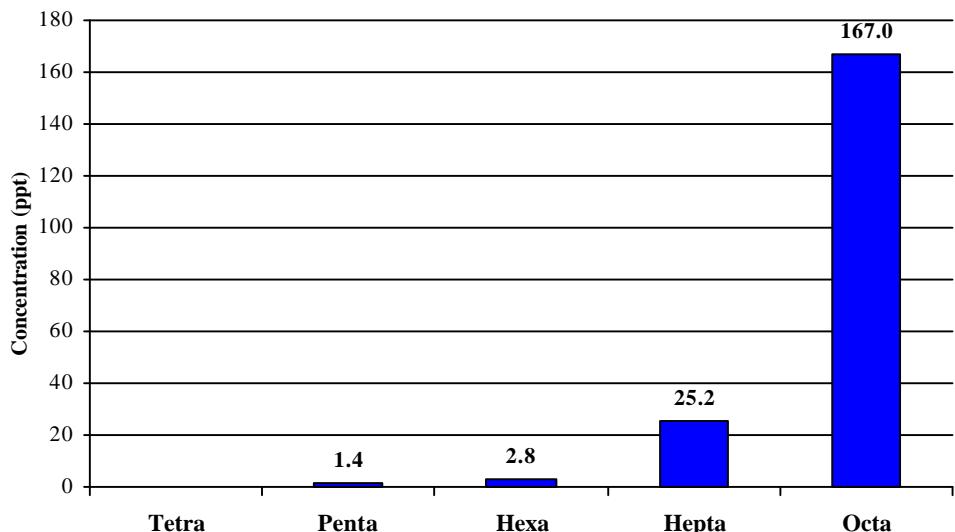


*Sample 318**S11***Full Concentrations: Homologue Profile**

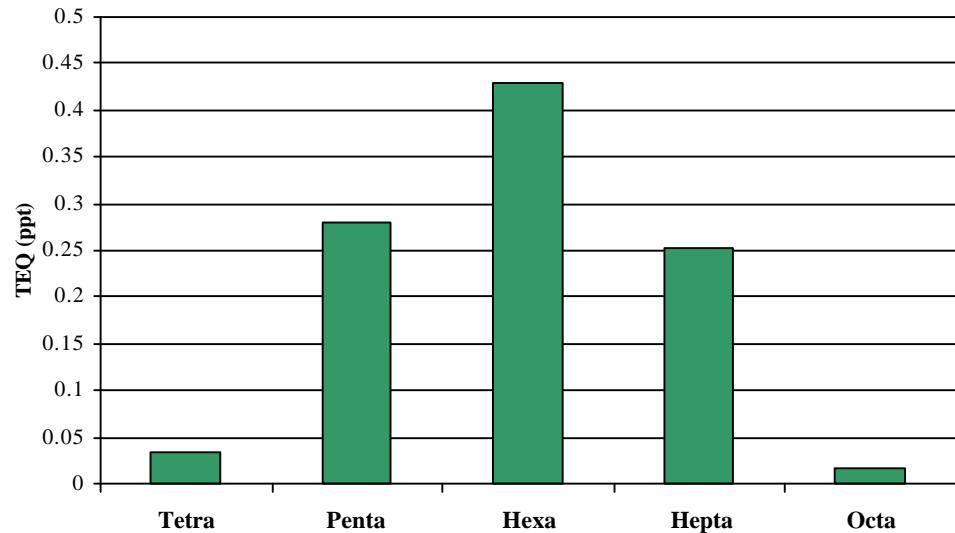
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

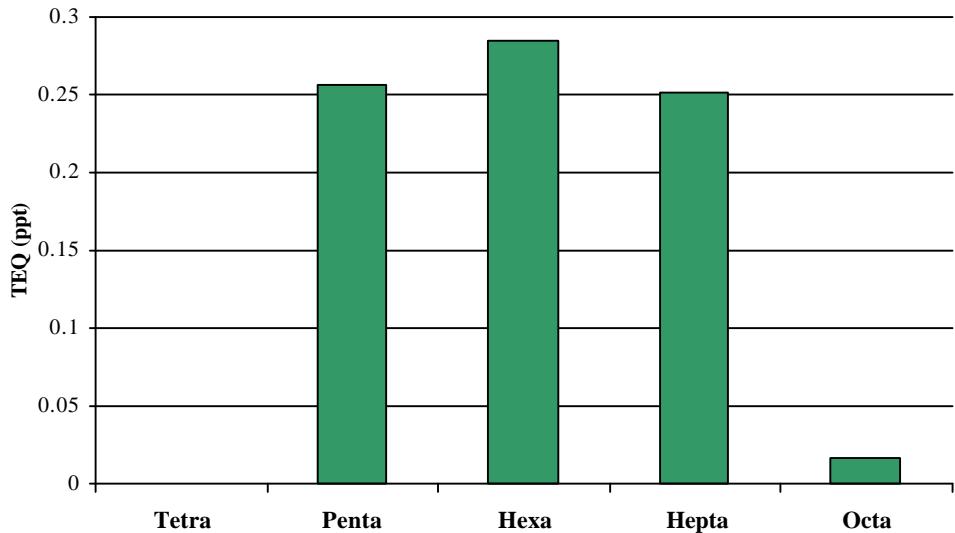
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

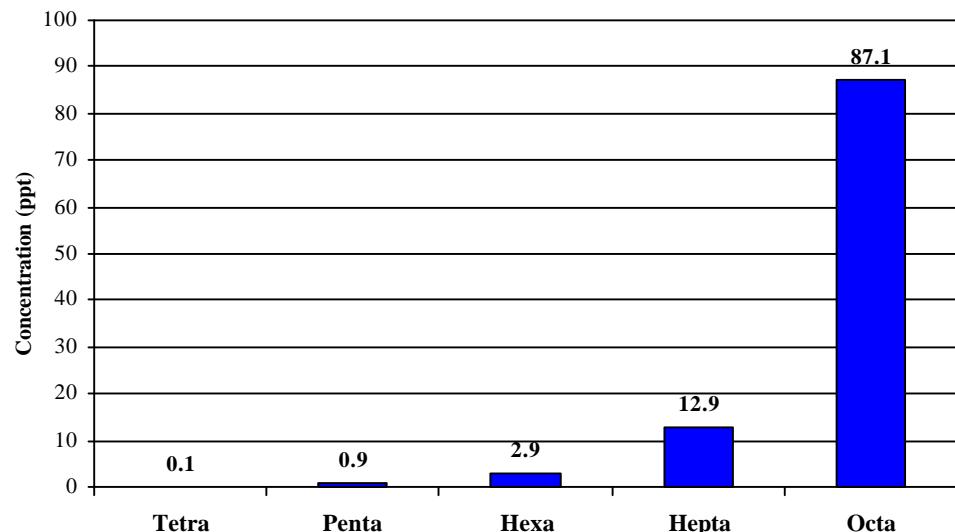
(Quantitative Data Set; Values Greater Than QL)



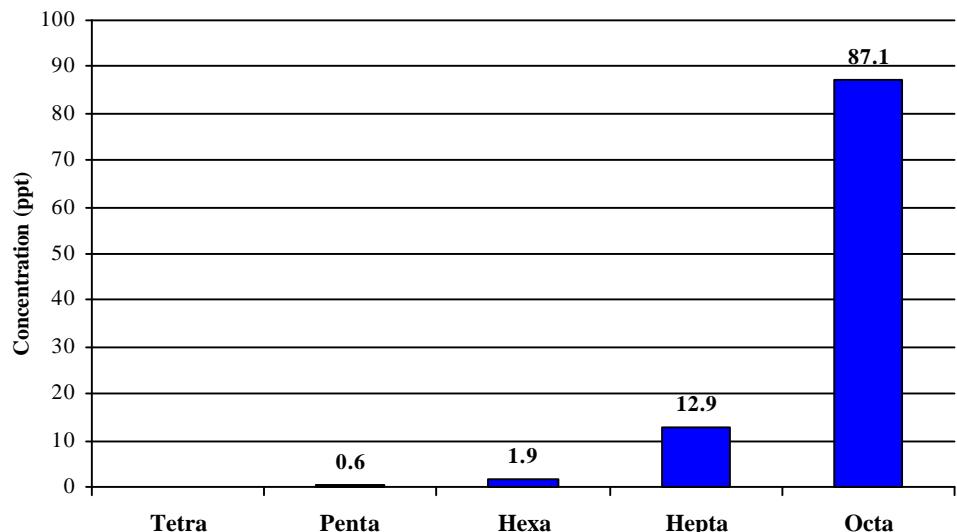
Sample 567

SI2

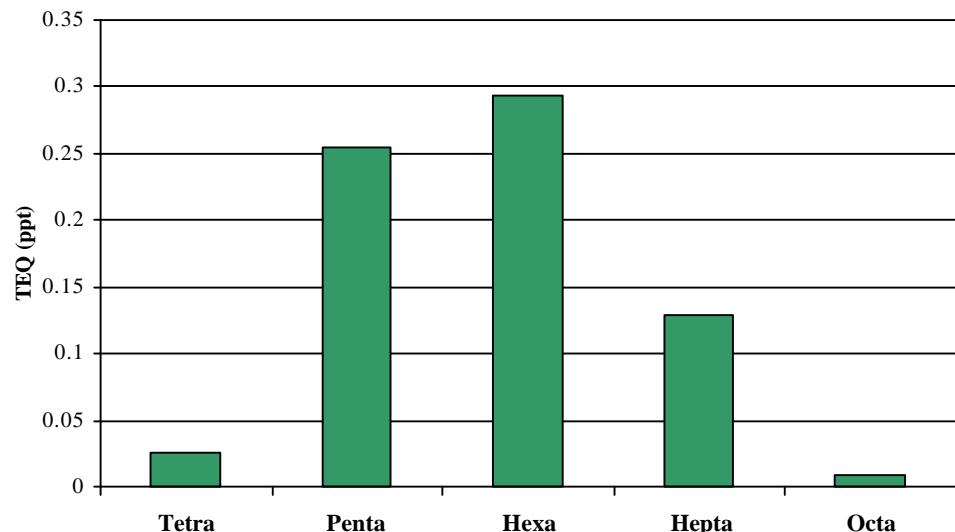
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



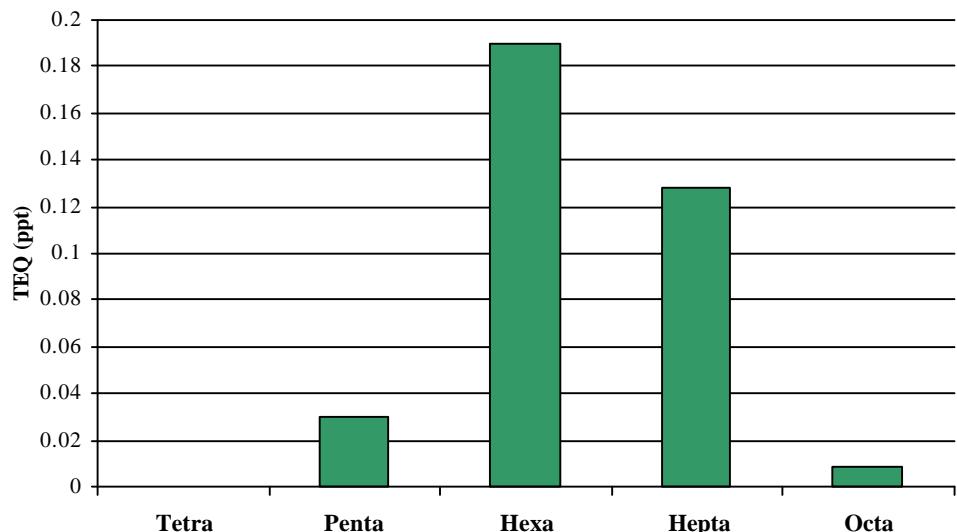
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



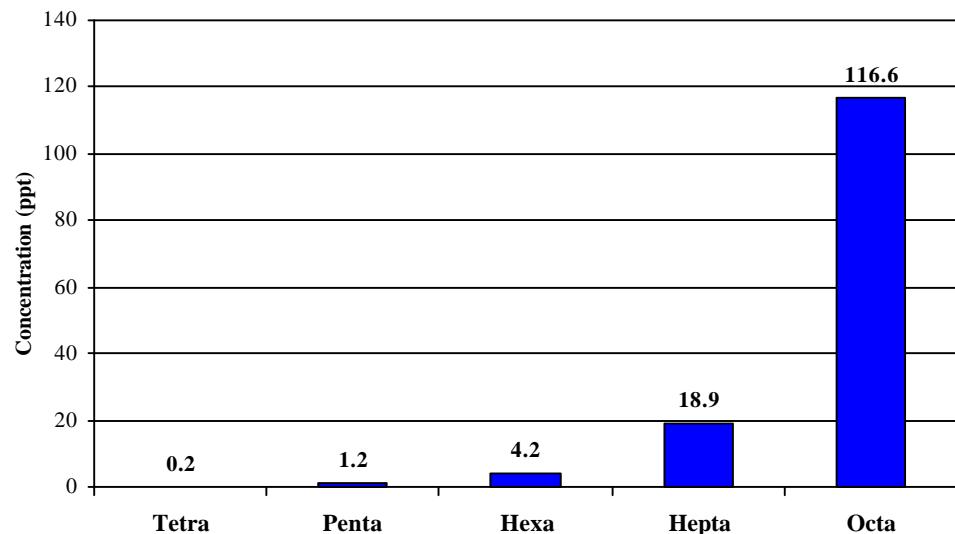
Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



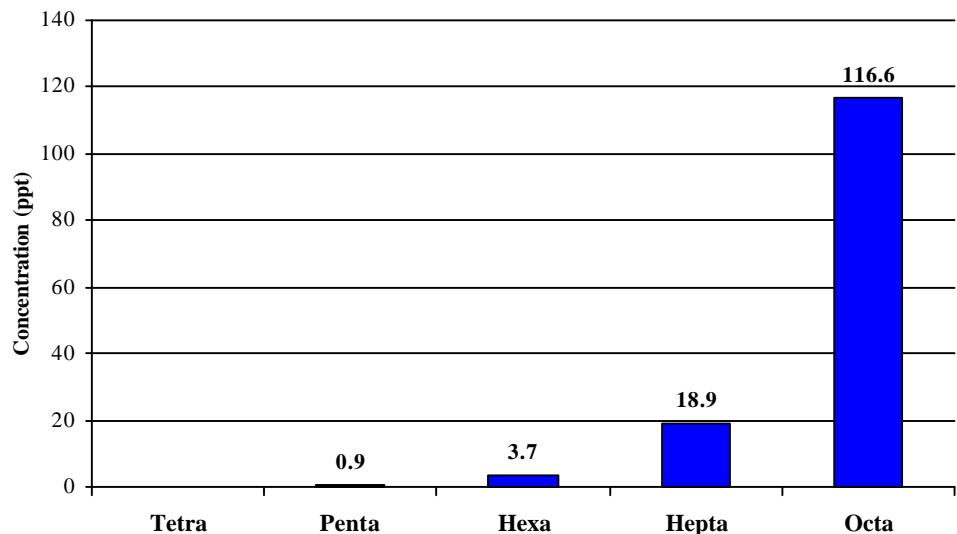
Sample 187

S19

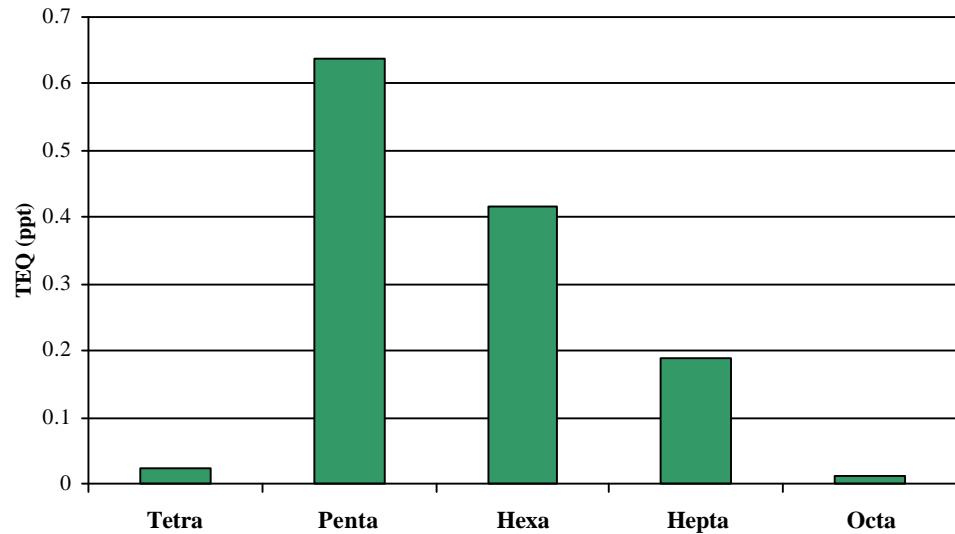
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



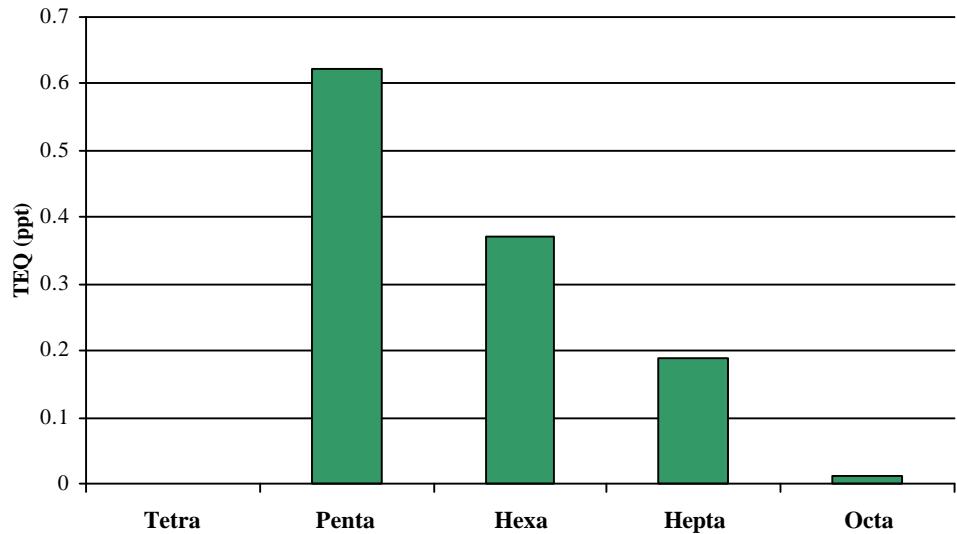
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)

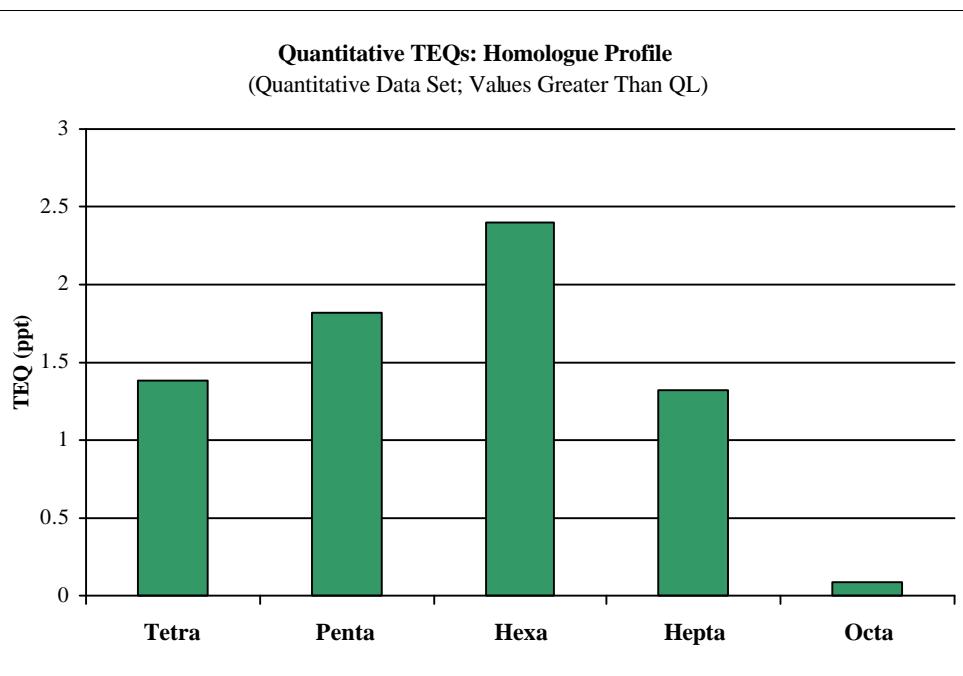
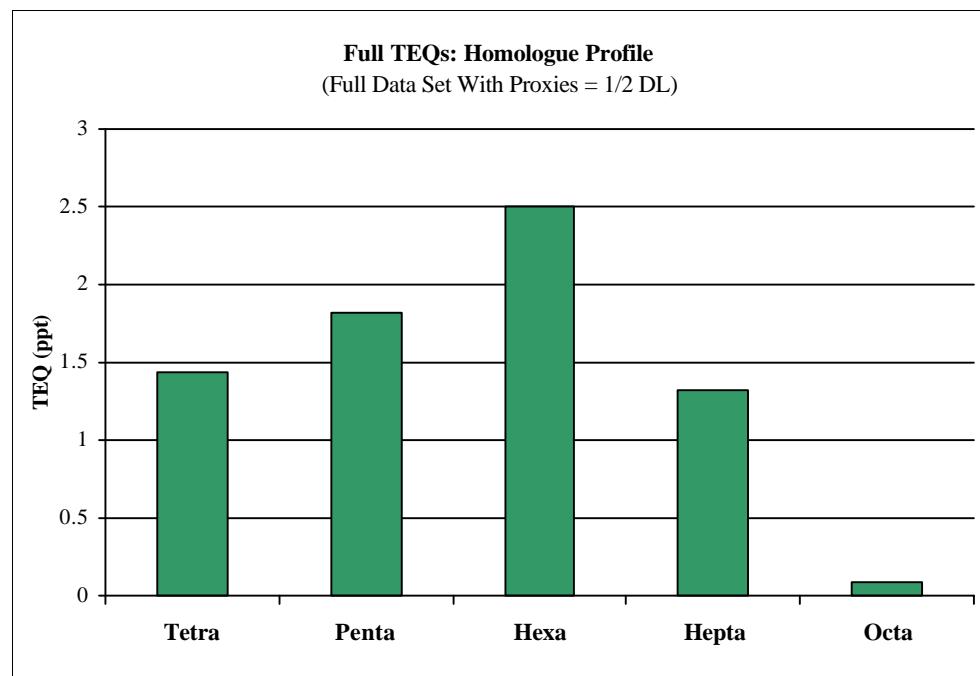
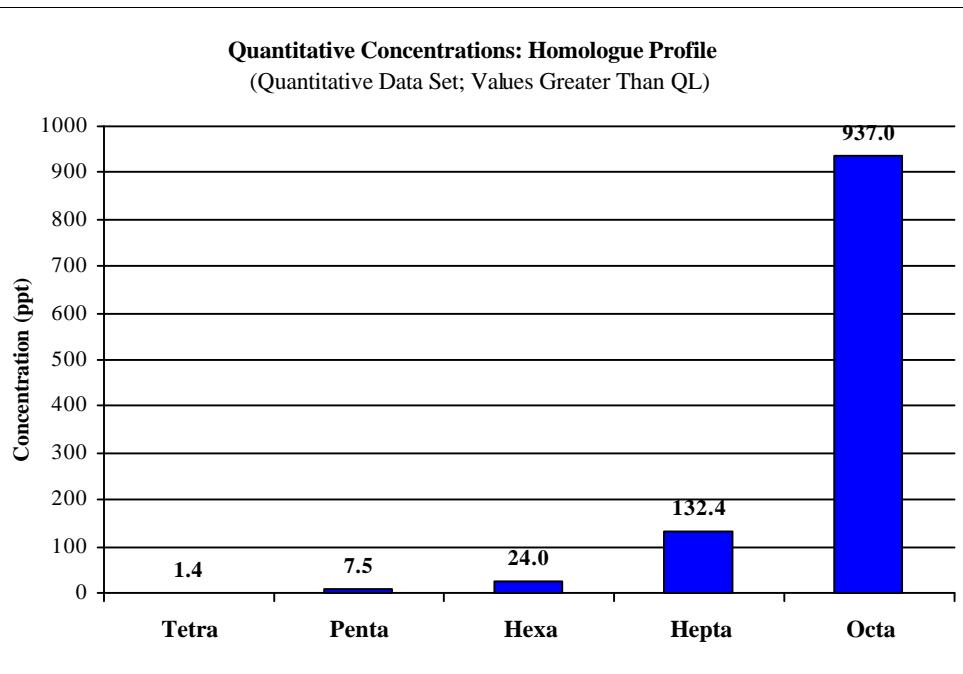
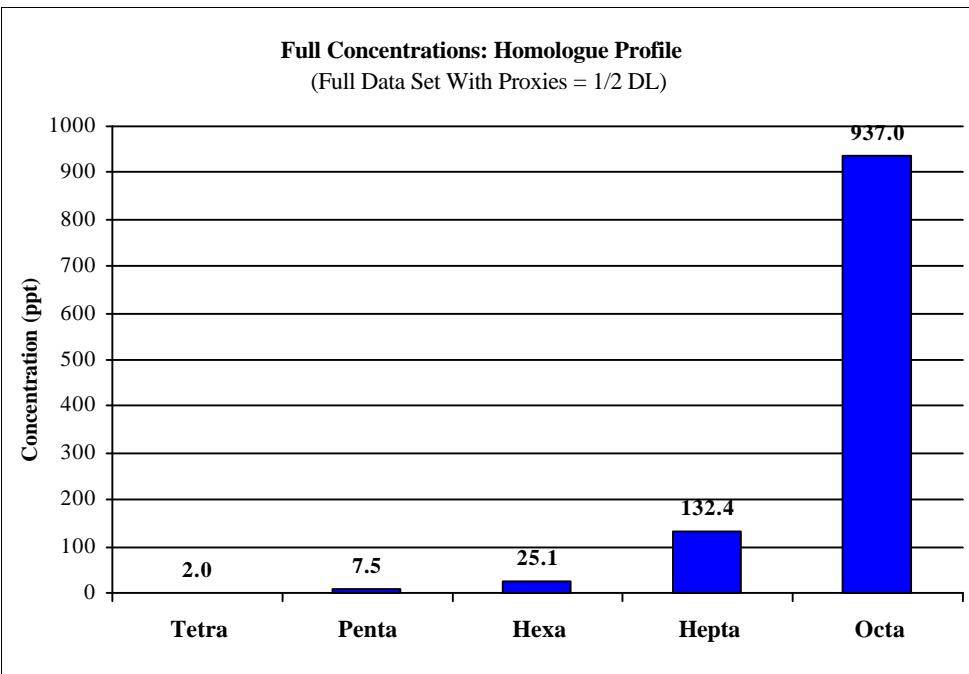


Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Sample 429

S2

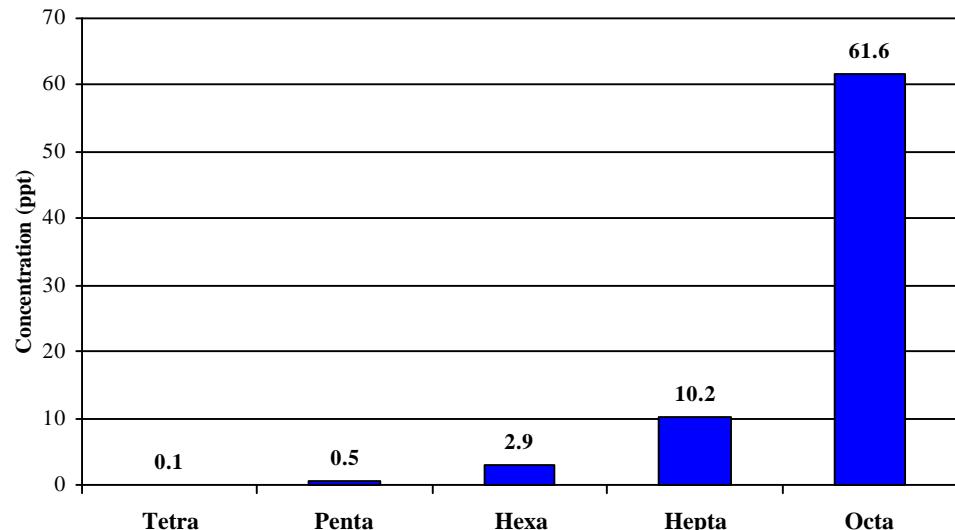


Appendix B2. Homologue Profiles

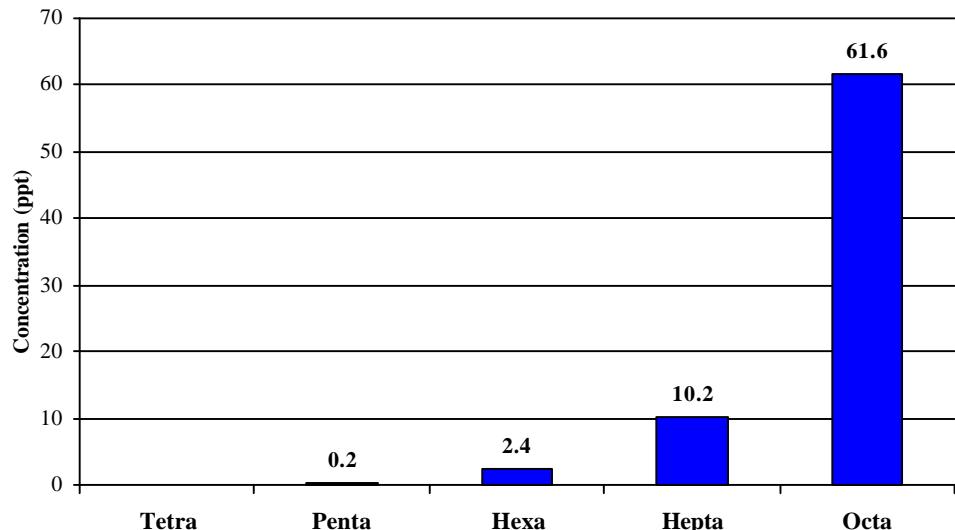
Sample 291

S20

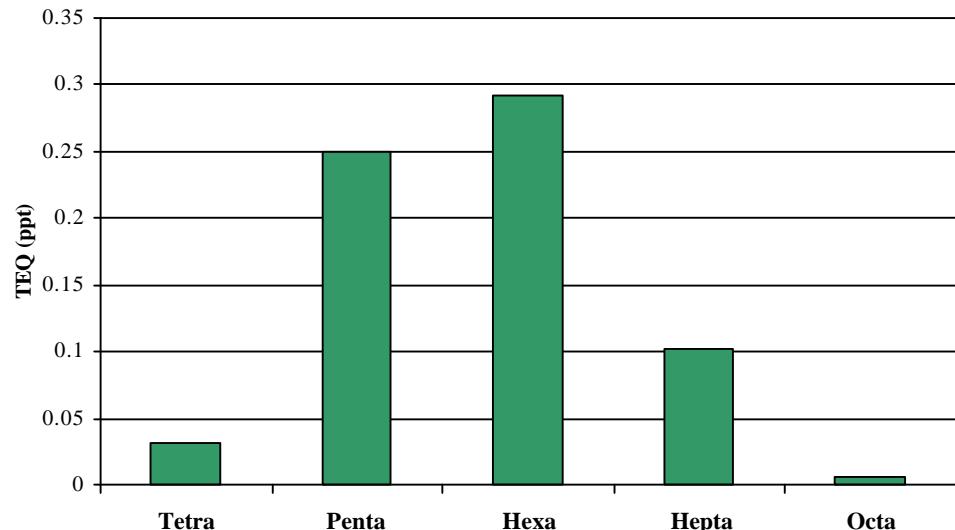
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



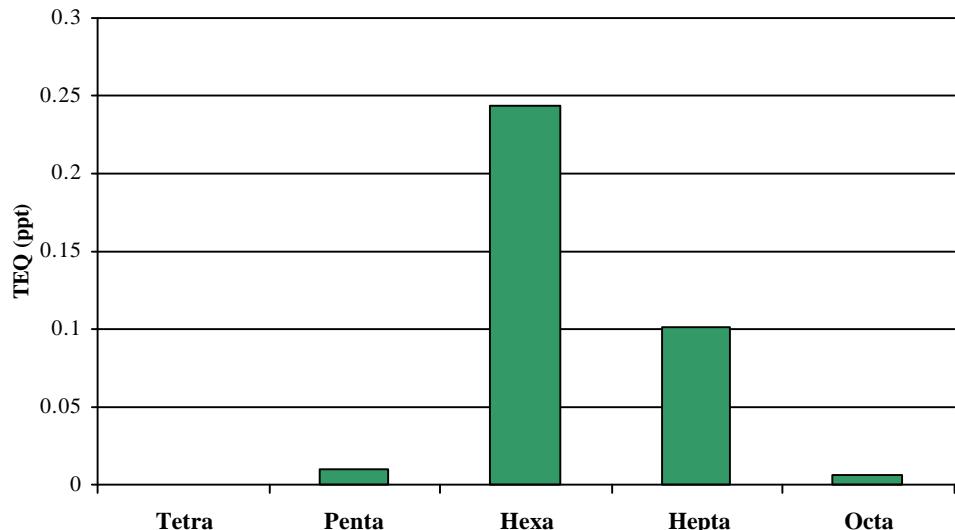
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

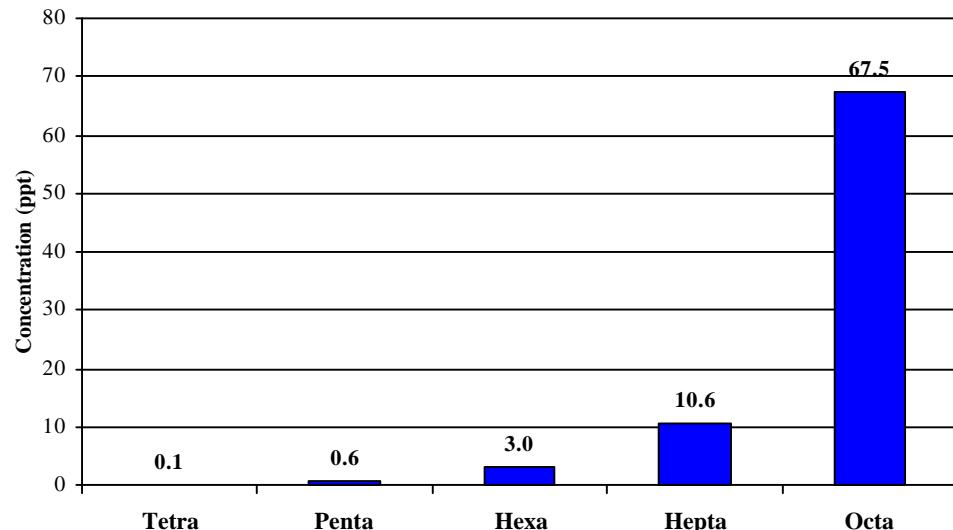


Appendix B2. Homologue Profiles

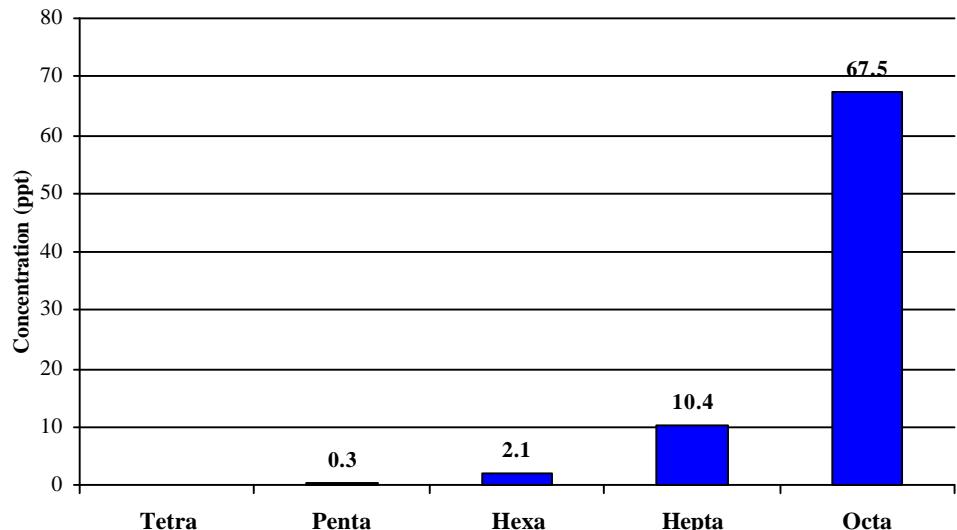
Sample 644

S22

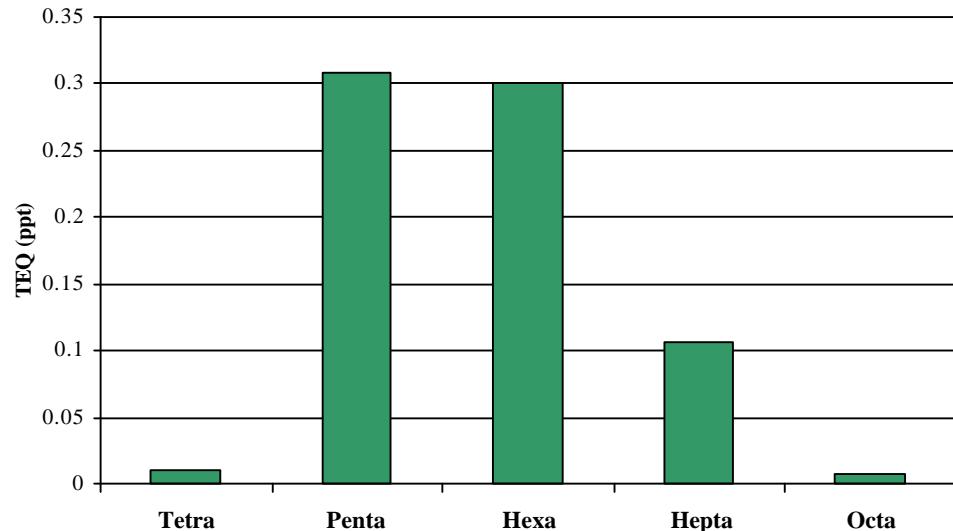
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



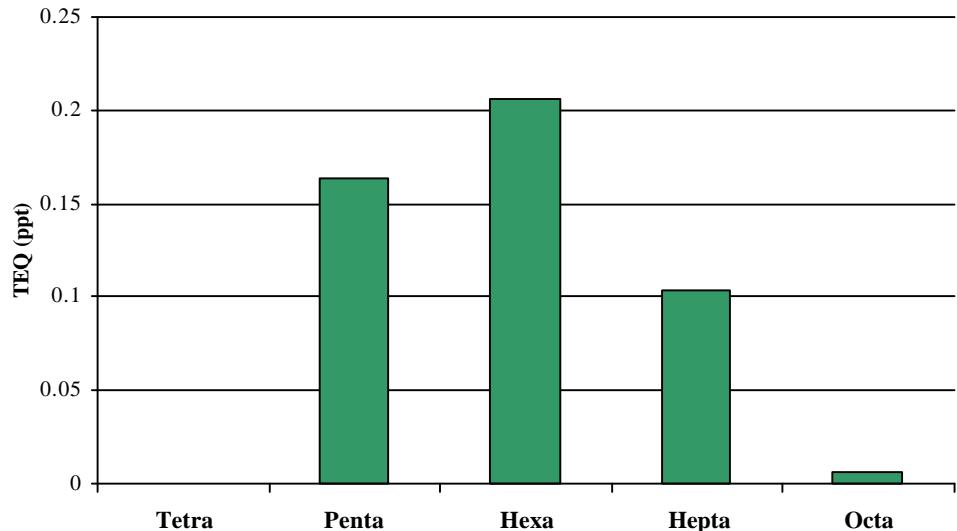
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

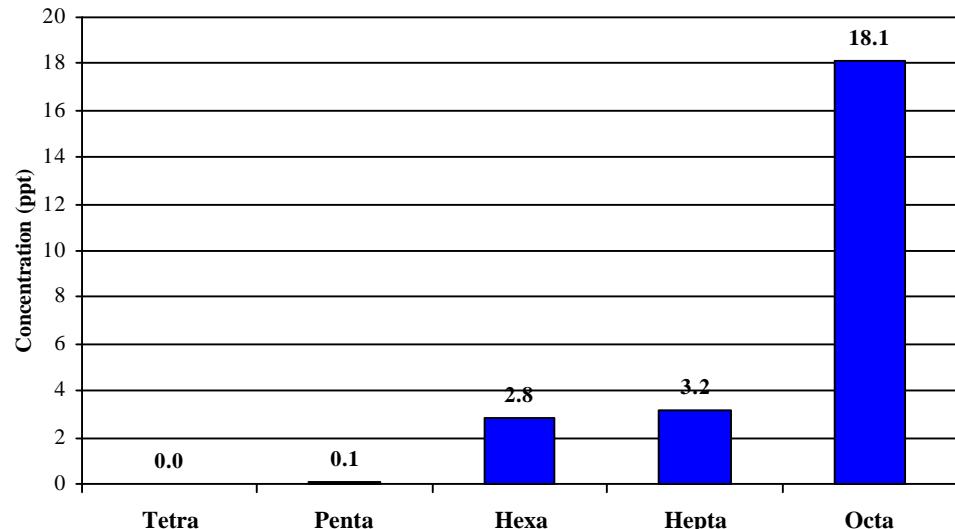


Sample 521

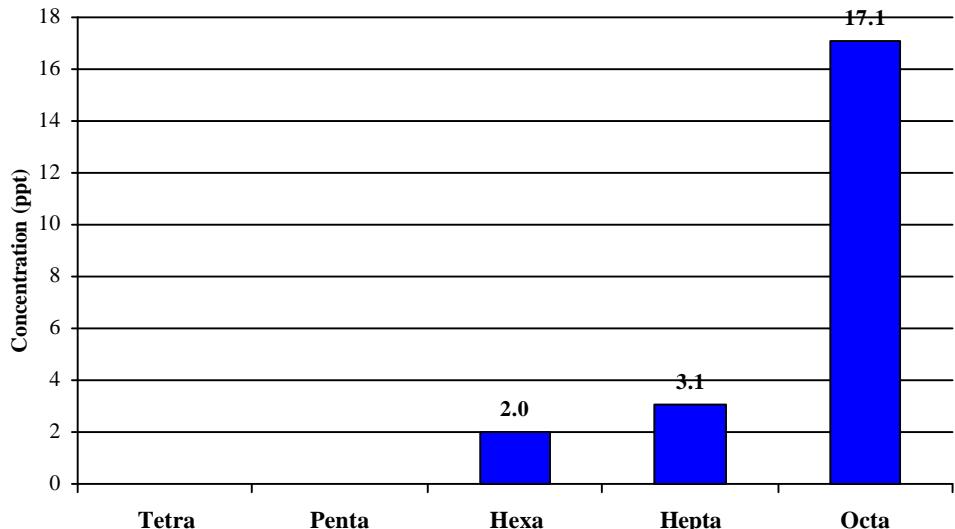
S23

Full Concentrations: Homologue Profile

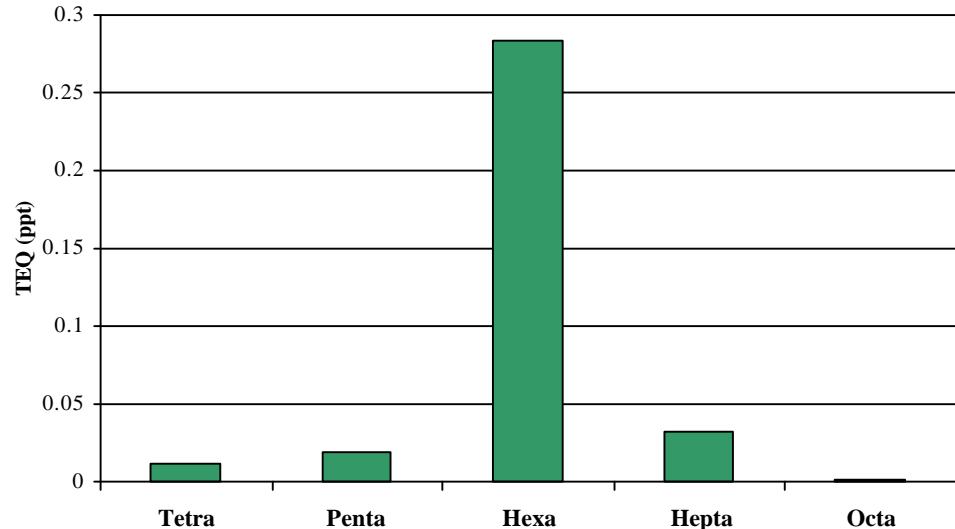
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

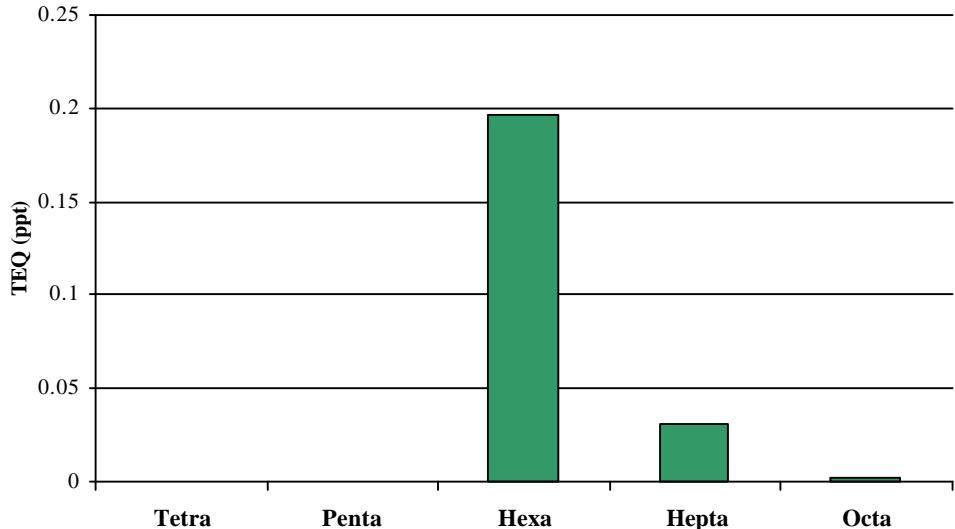
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

(Quantitative Data Set; Values Greater Than QL)

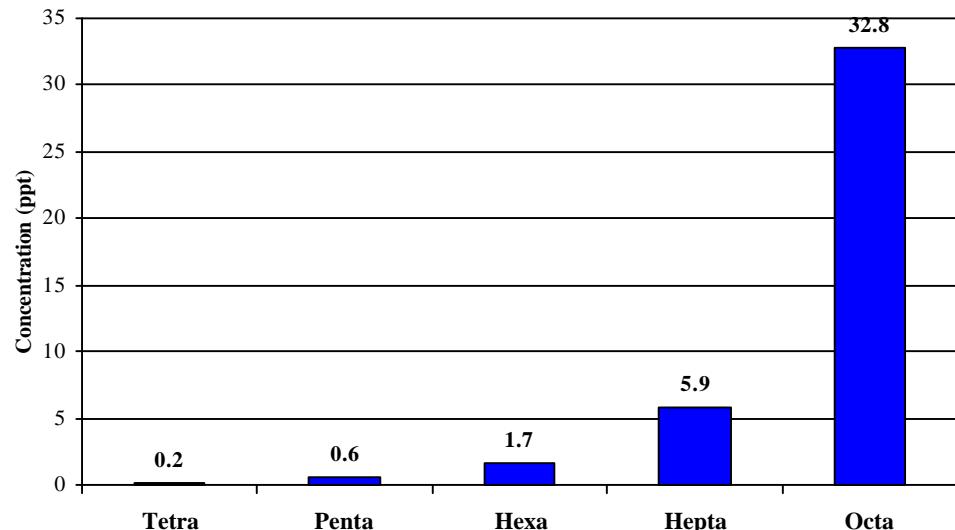


Sample 385

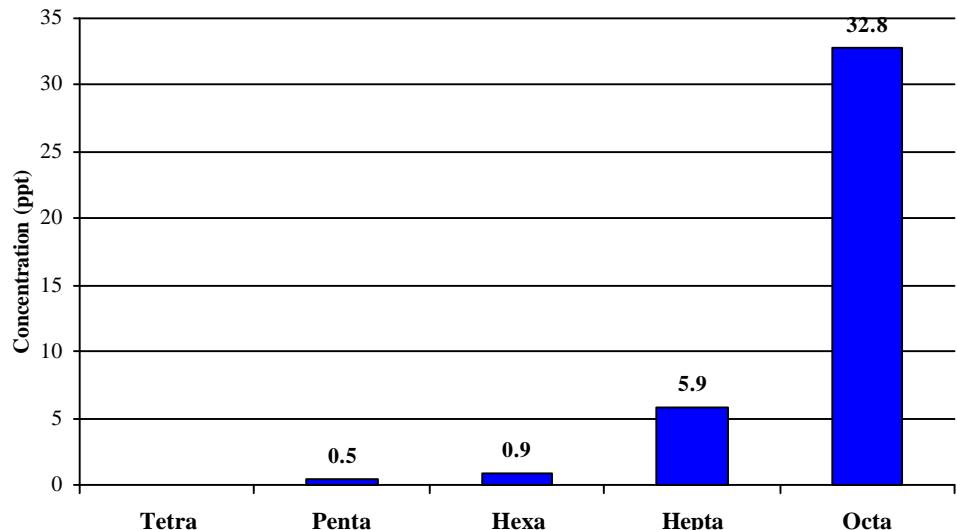
S24

Full Concentrations: Homologue Profile

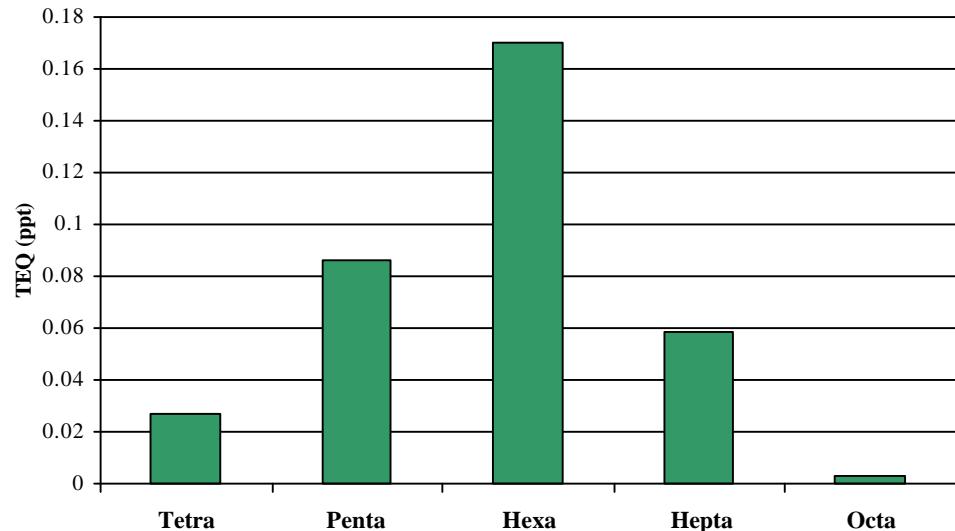
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

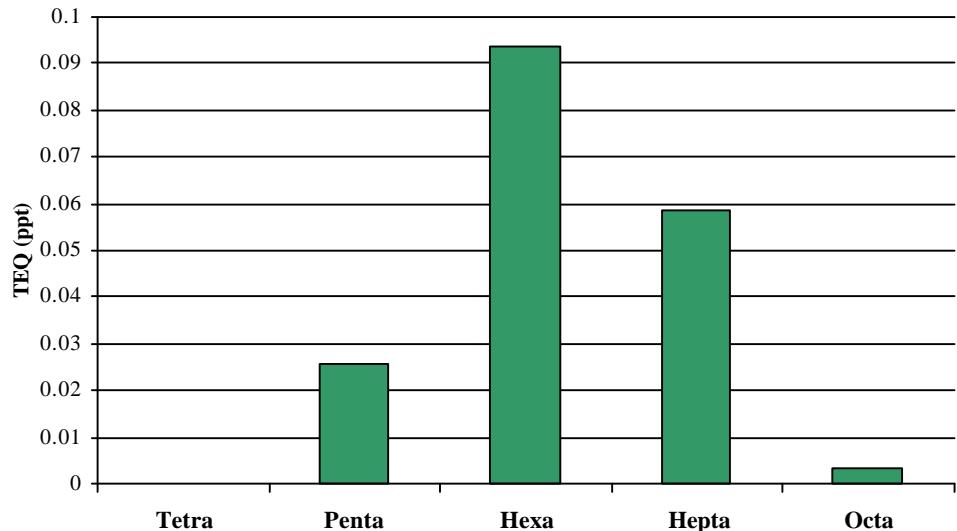
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

(Quantitative Data Set; Values Greater Than QL)



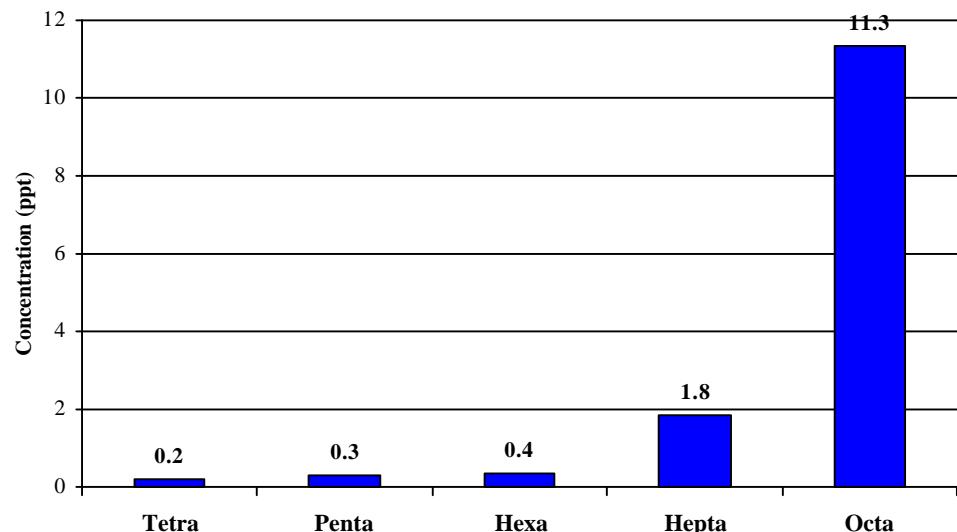
Appendix B2. Homologue Profiles

Sample 847

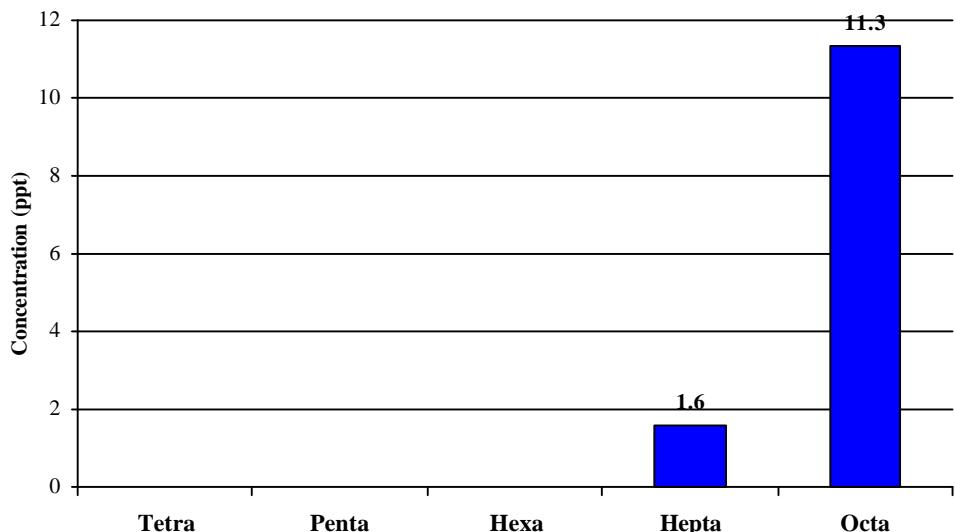
S25

Full Concentrations: Homologue Profile

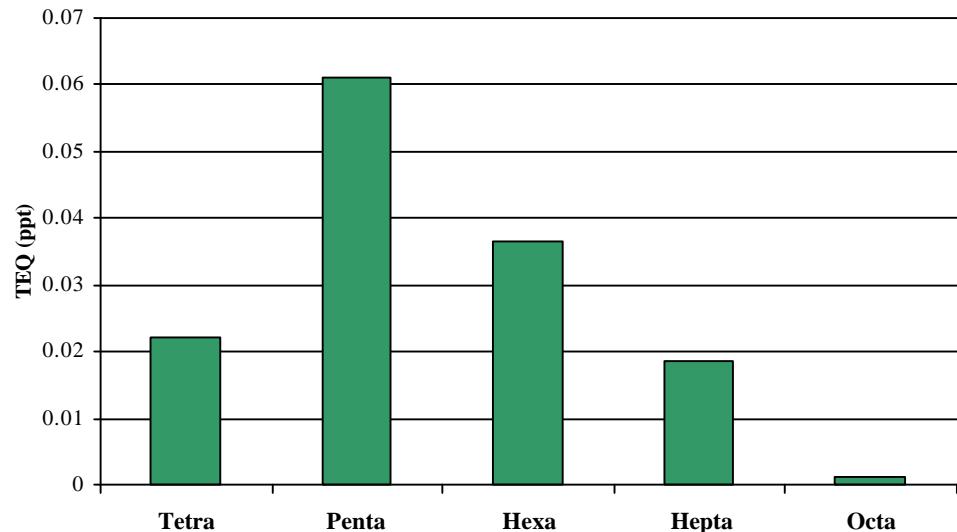
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

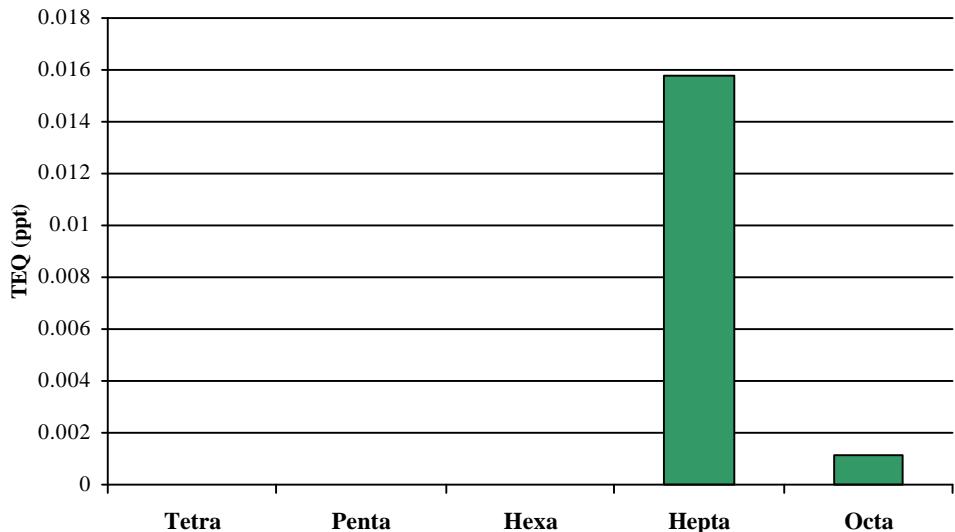
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

(Quantitative Data Set; Values Greater Than QL)



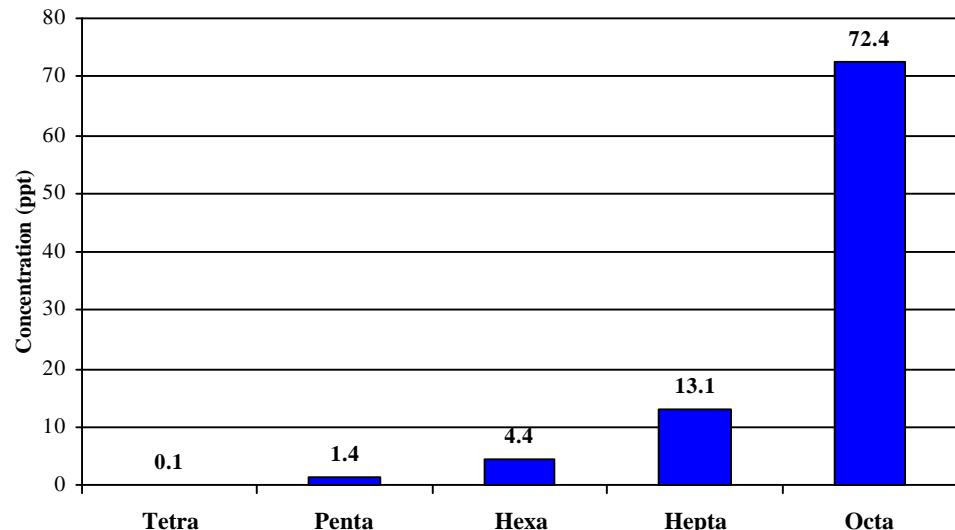
Appendix B2. Homologue Profiles

Sample 547

S26

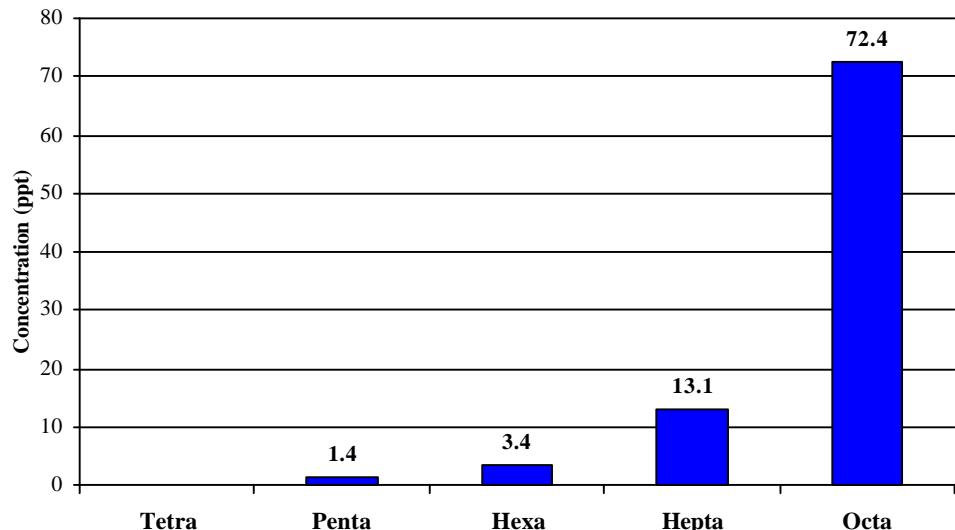
Full Concentrations: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



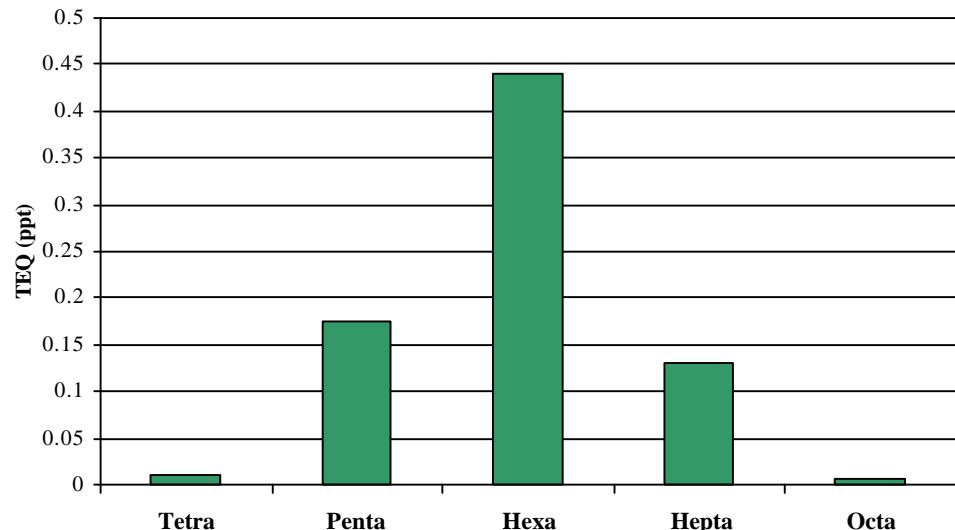
Quantitative Concentrations: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)



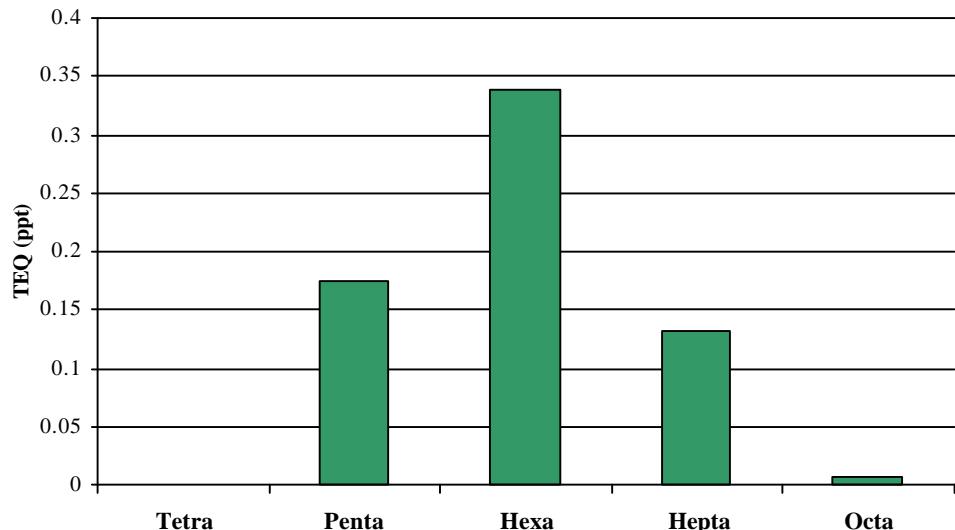
Full TEQs: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)

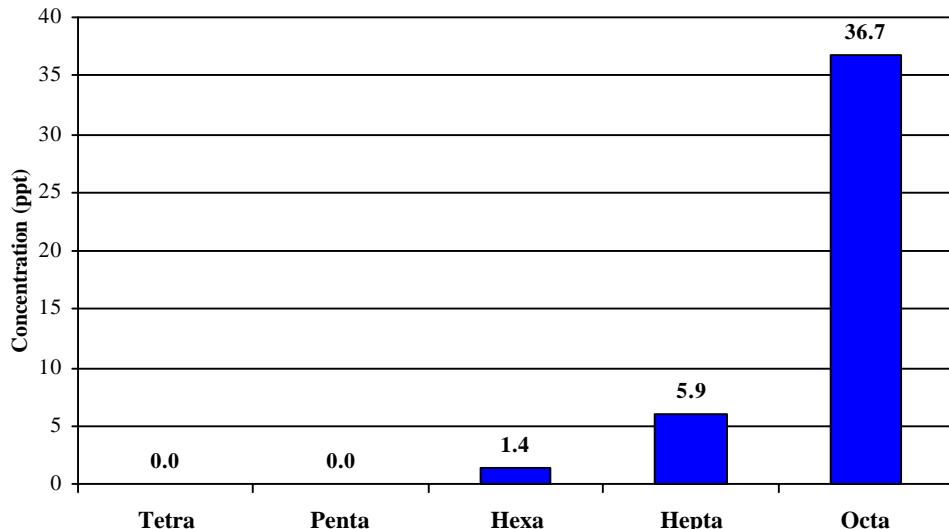


Appendix B2. Homologue Profiles

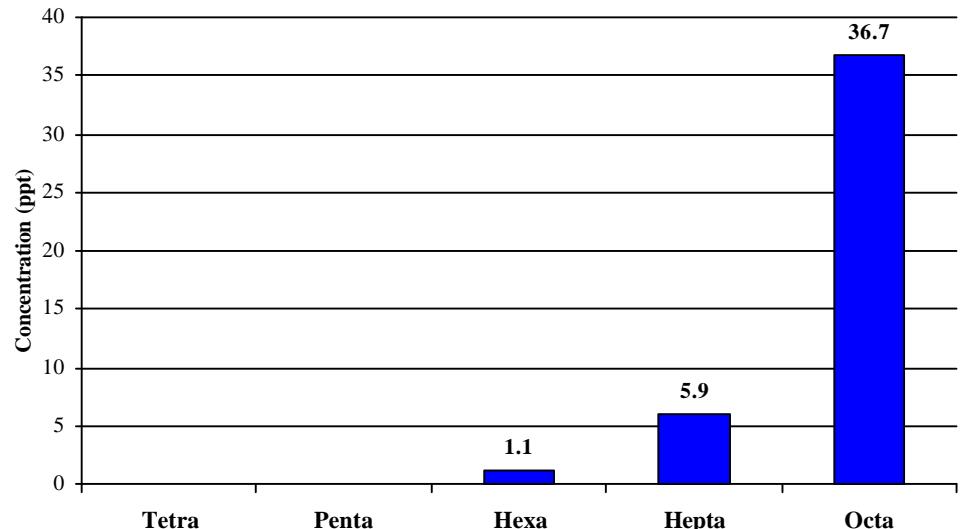
Sample 768

S27

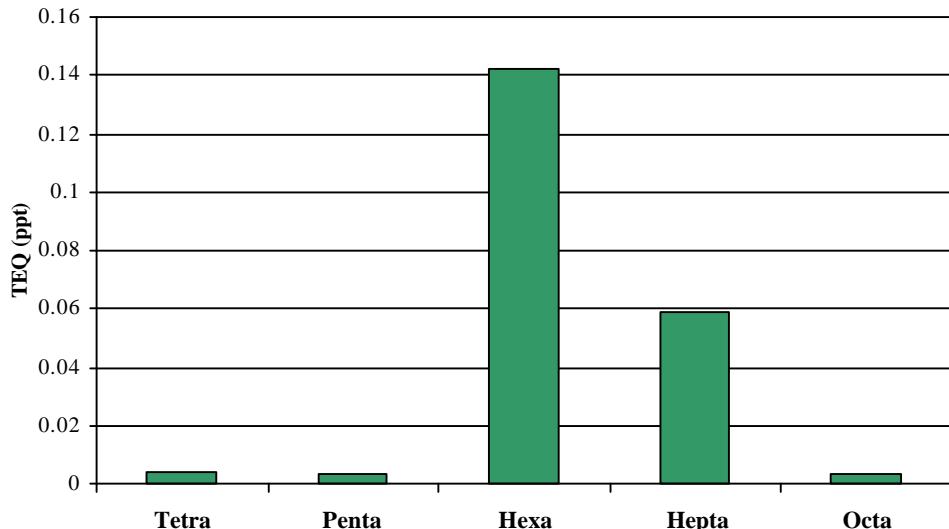
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



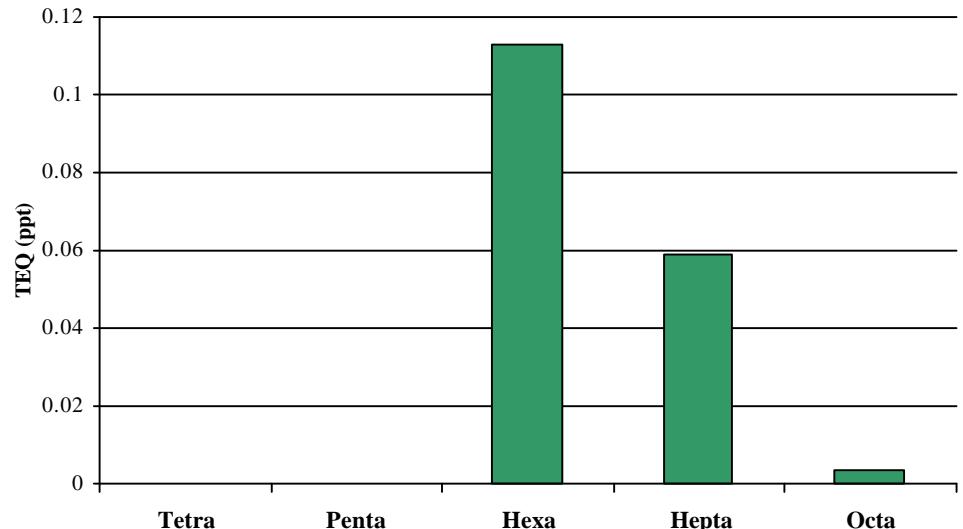
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



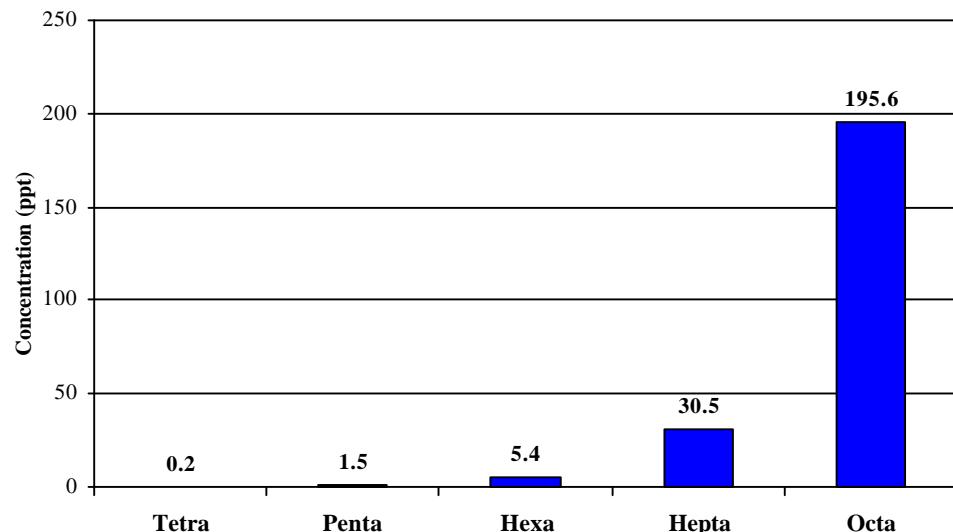
Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



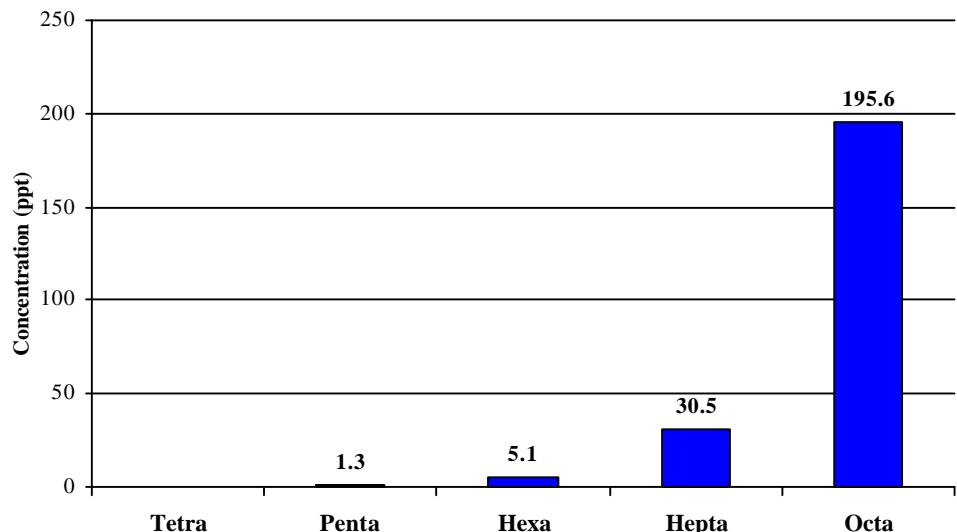
Sample 264

S28

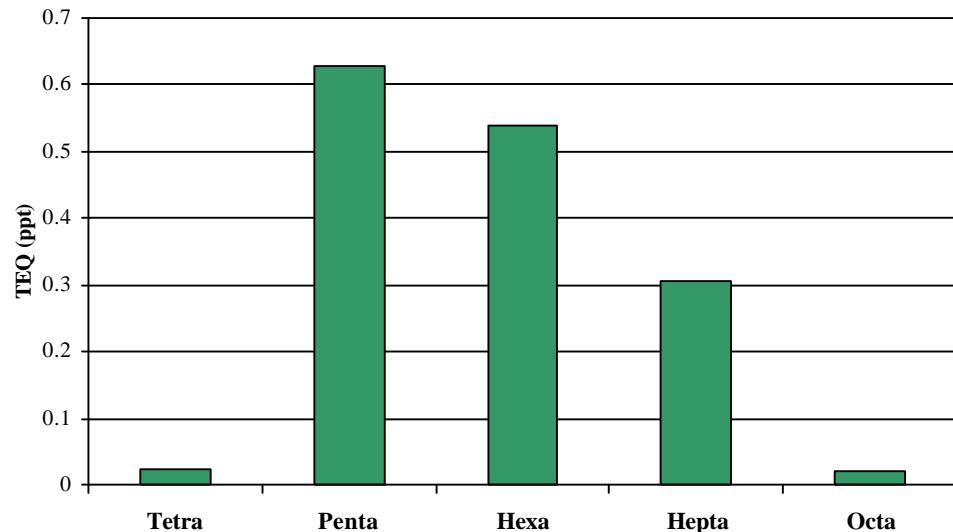
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



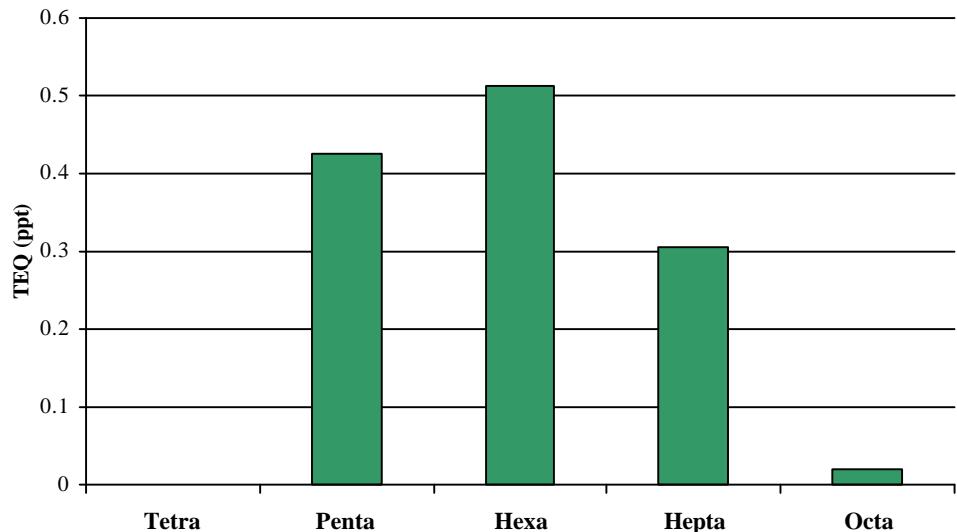
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

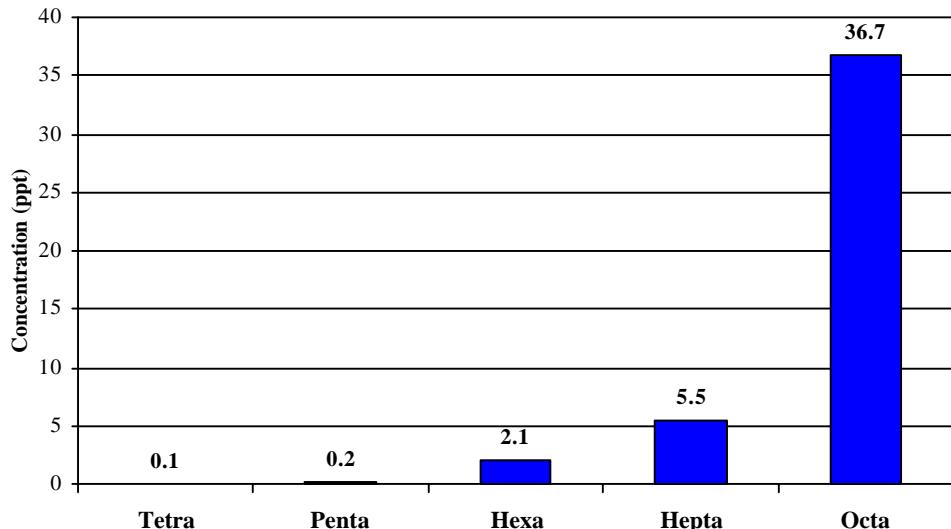


Sample 443

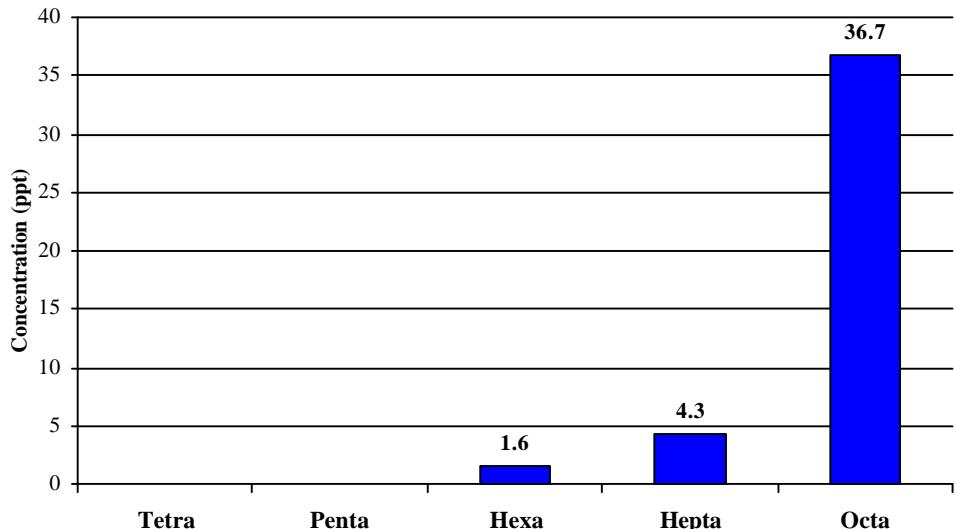
S29

Full Concentrations: Homologue Profile

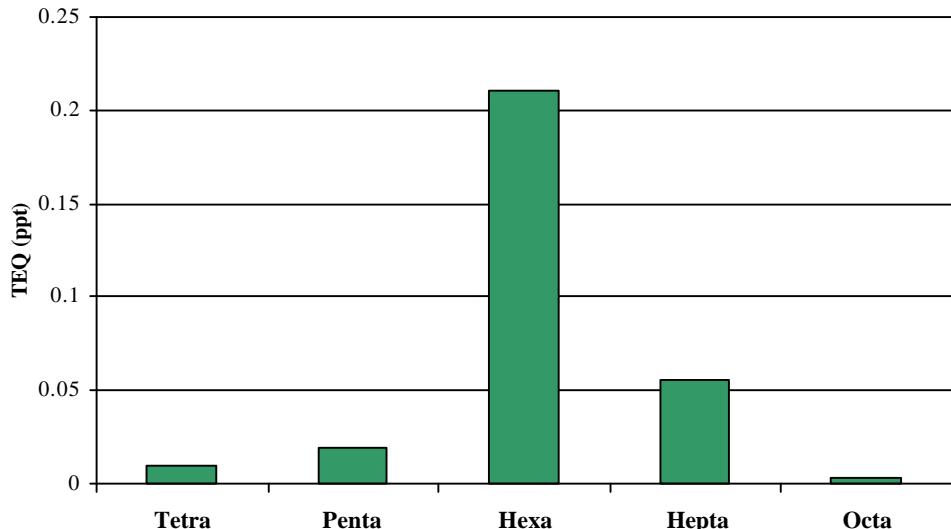
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

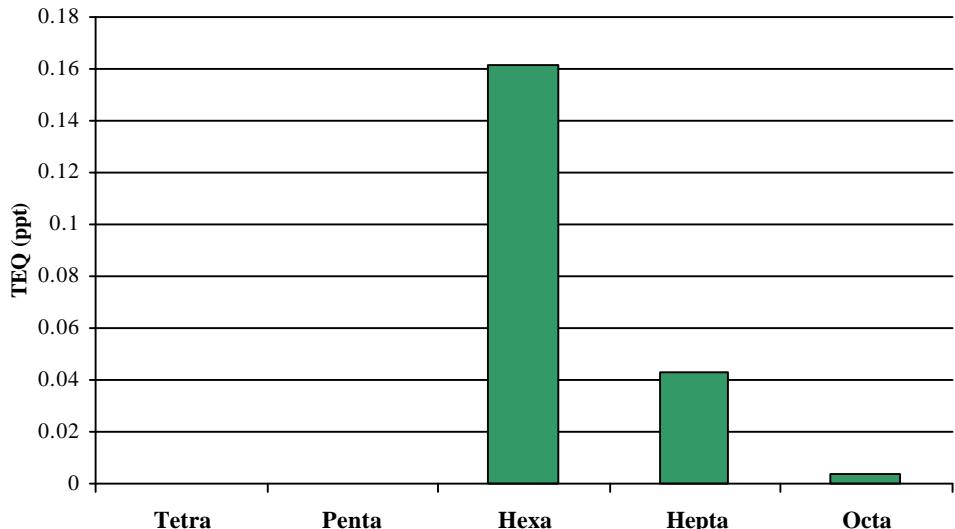
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

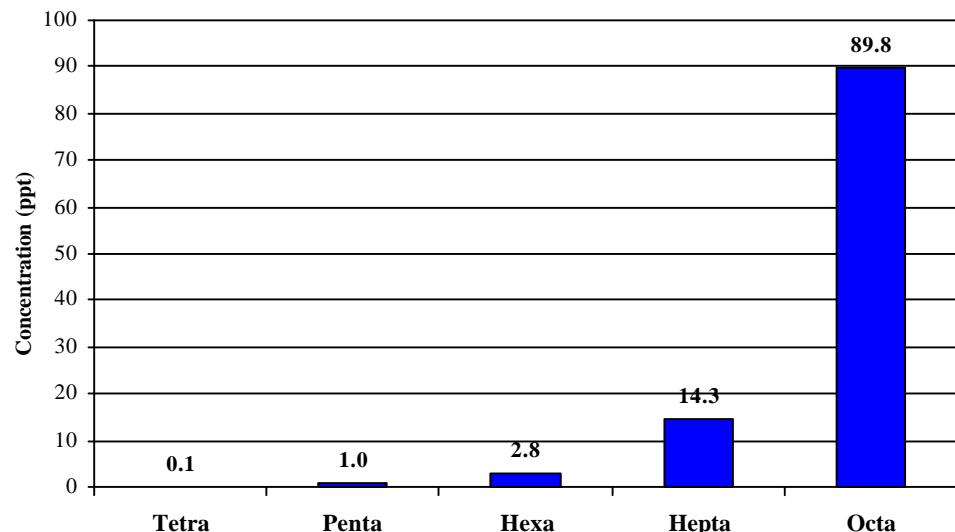
(Quantitative Data Set; Values Greater Than QL)



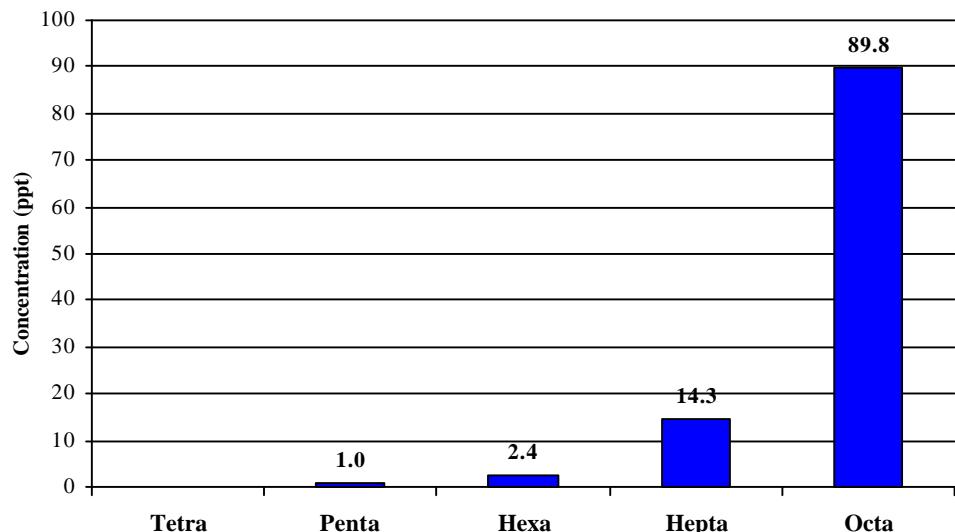
Sample 641

S3

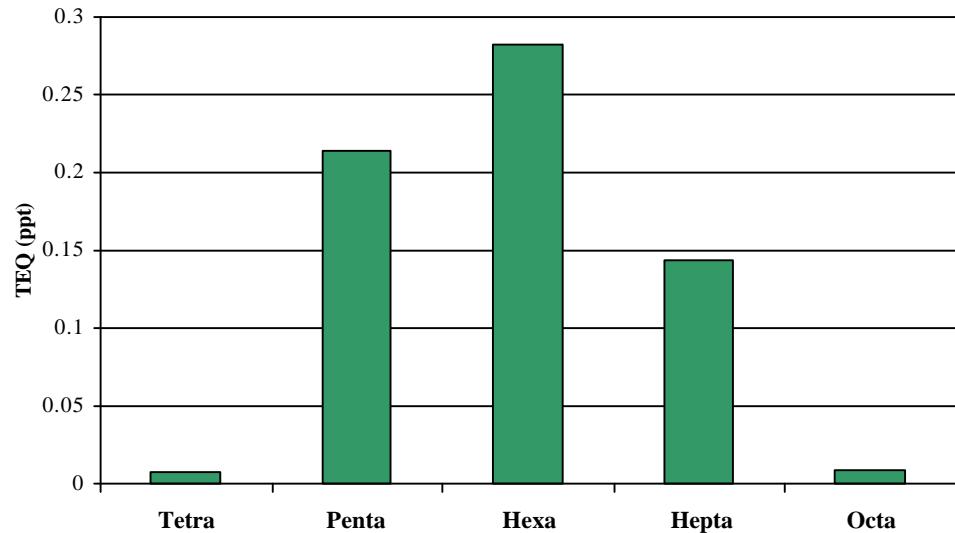
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



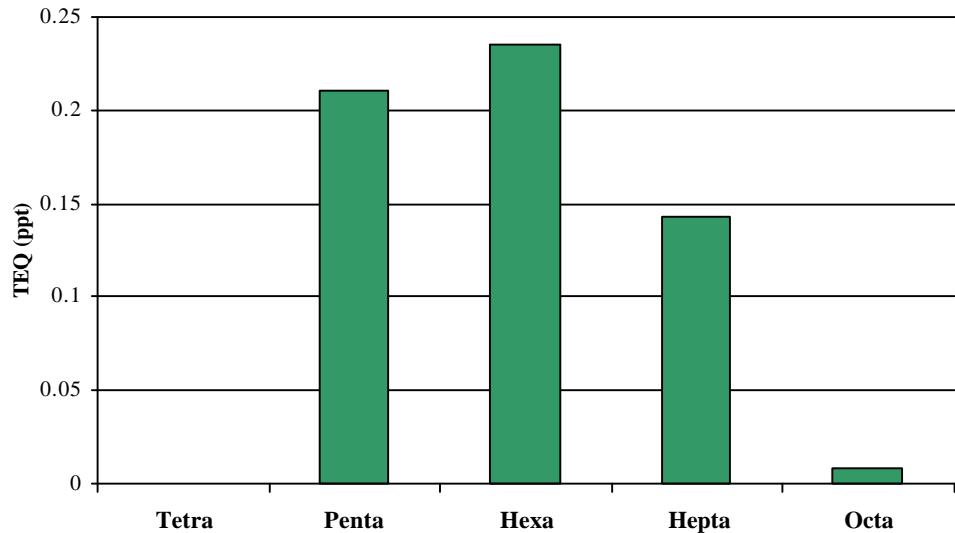
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)

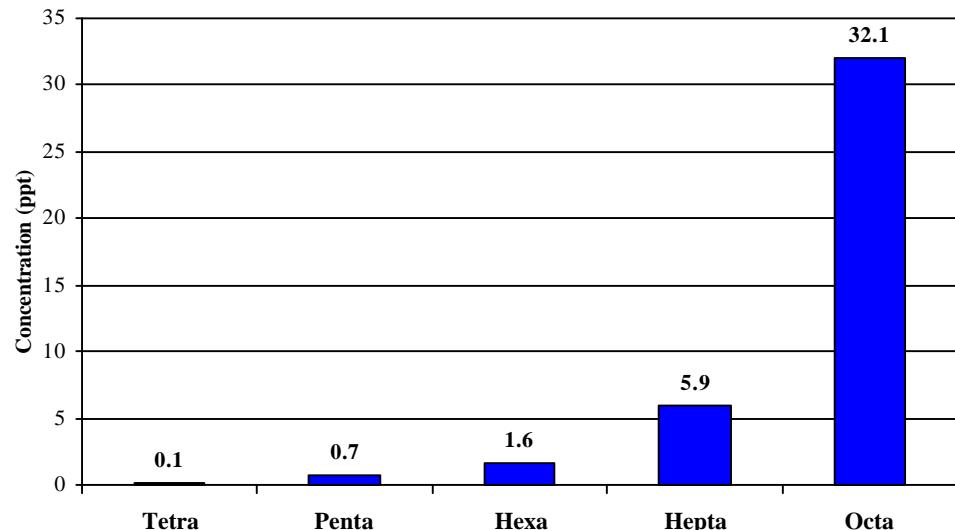


Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

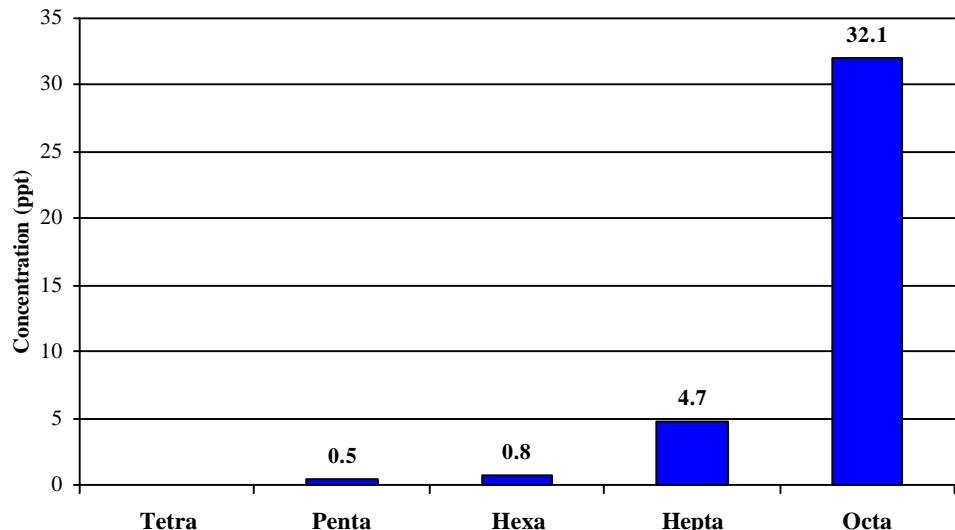


*Sample 736**S30*

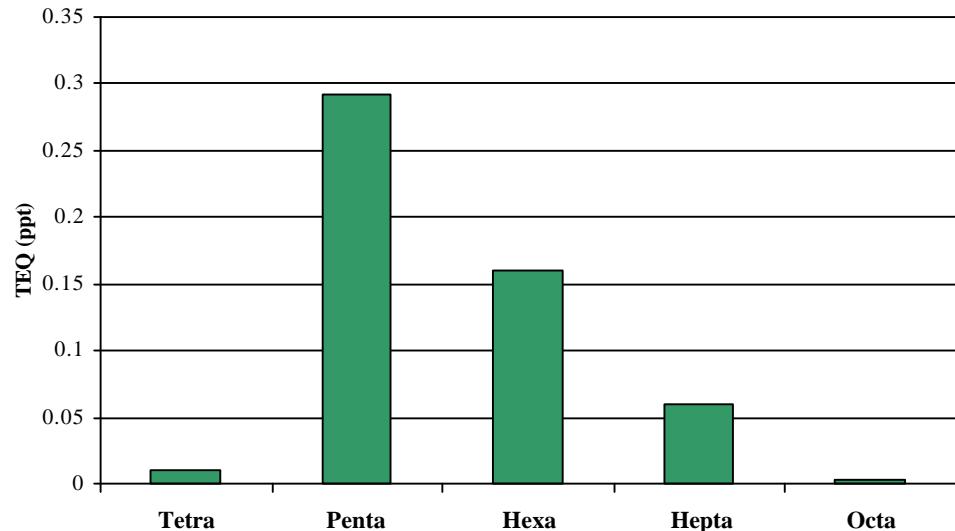
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



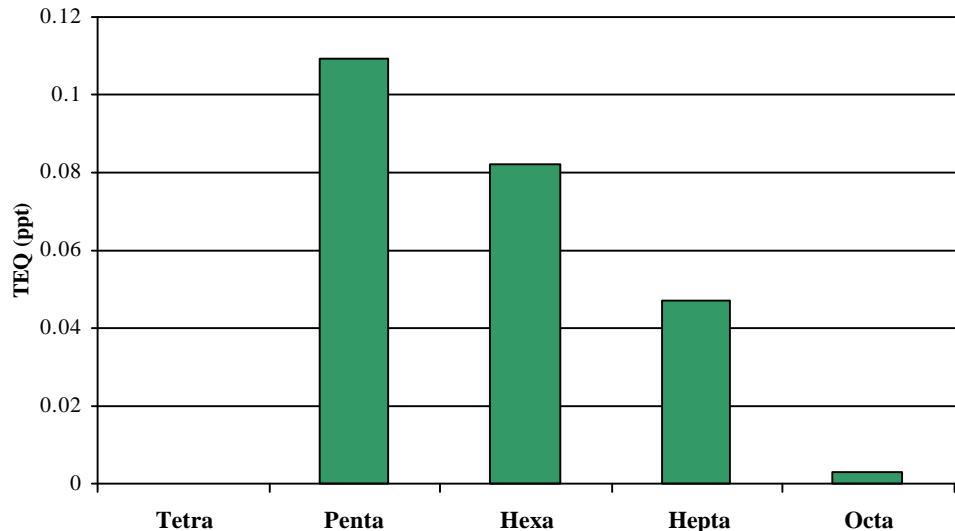
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



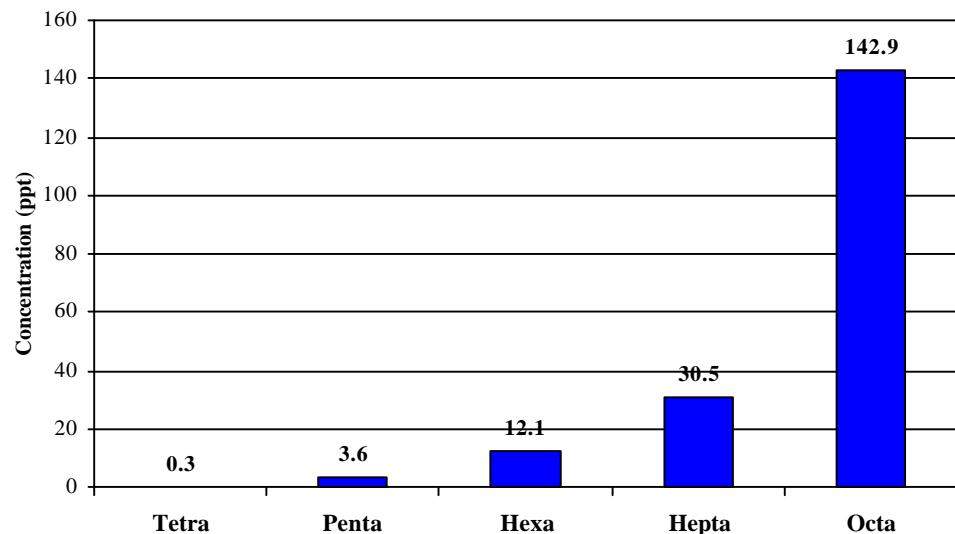
Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



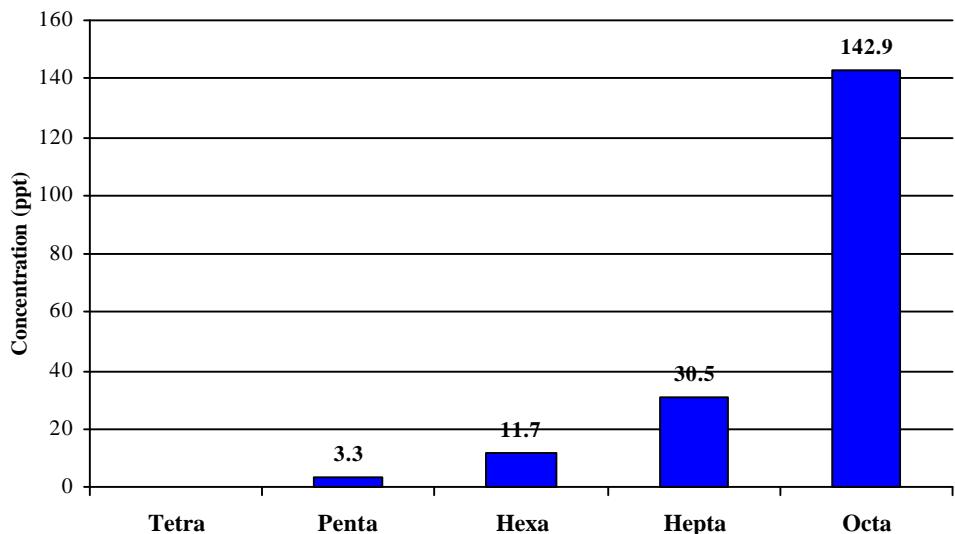
Sample 616

S31

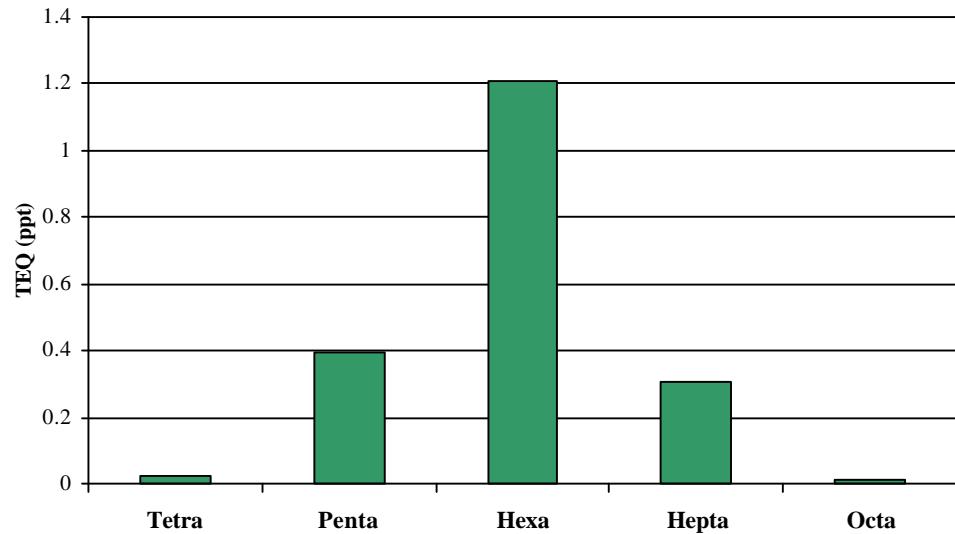
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



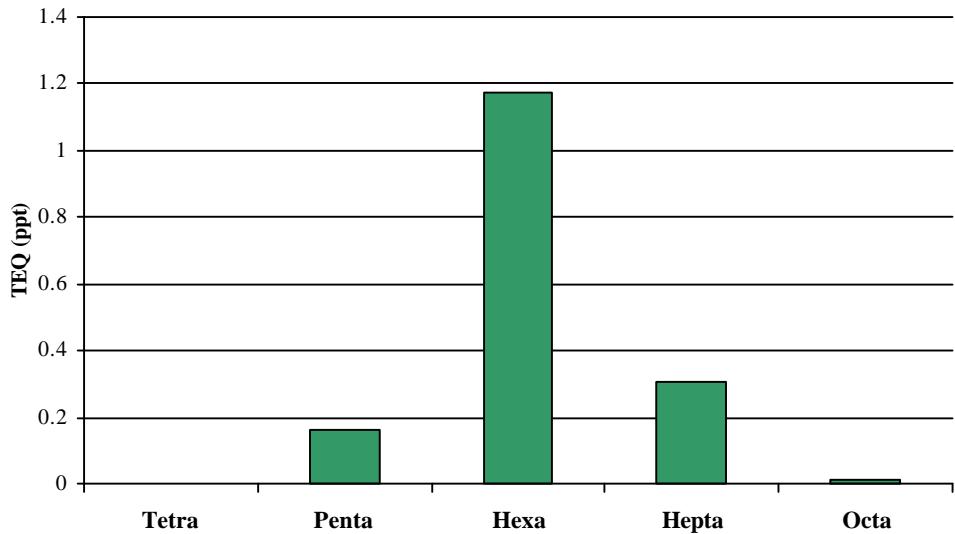
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



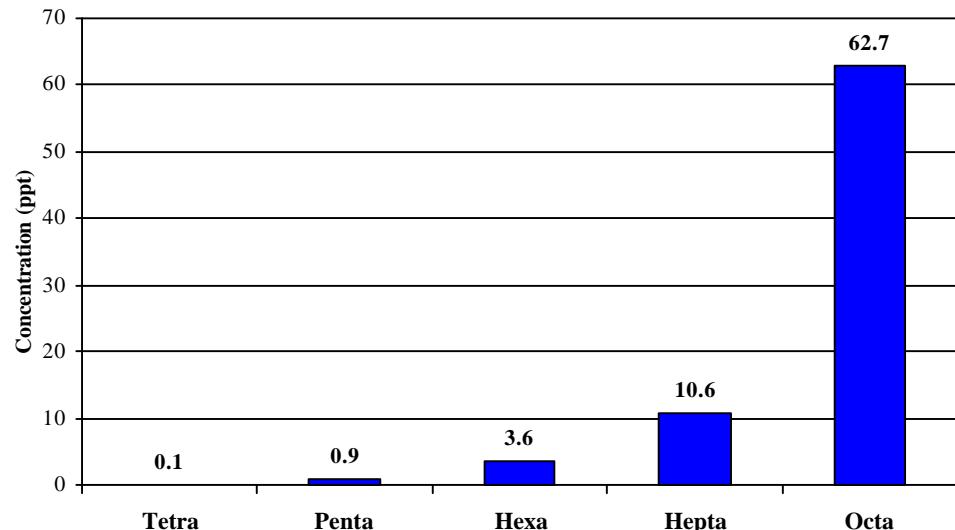
Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



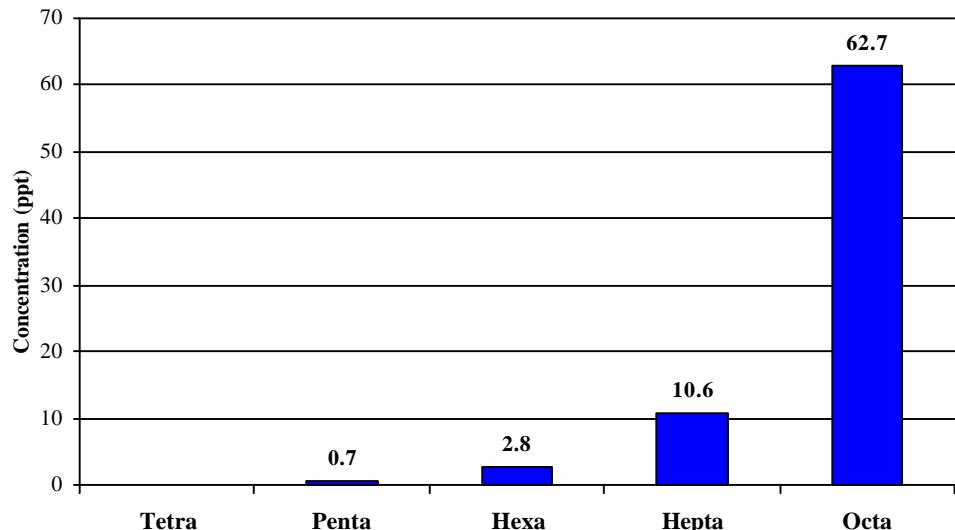
Sample 945

S32

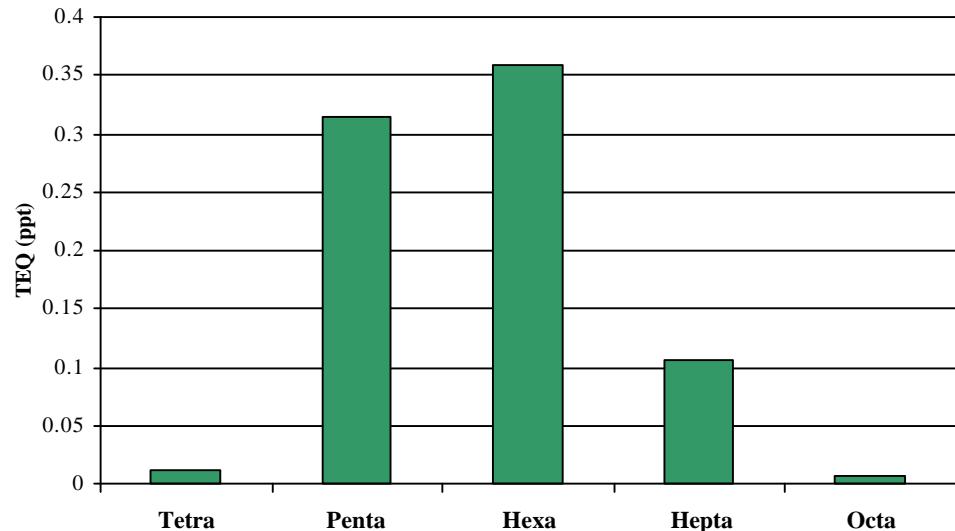
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



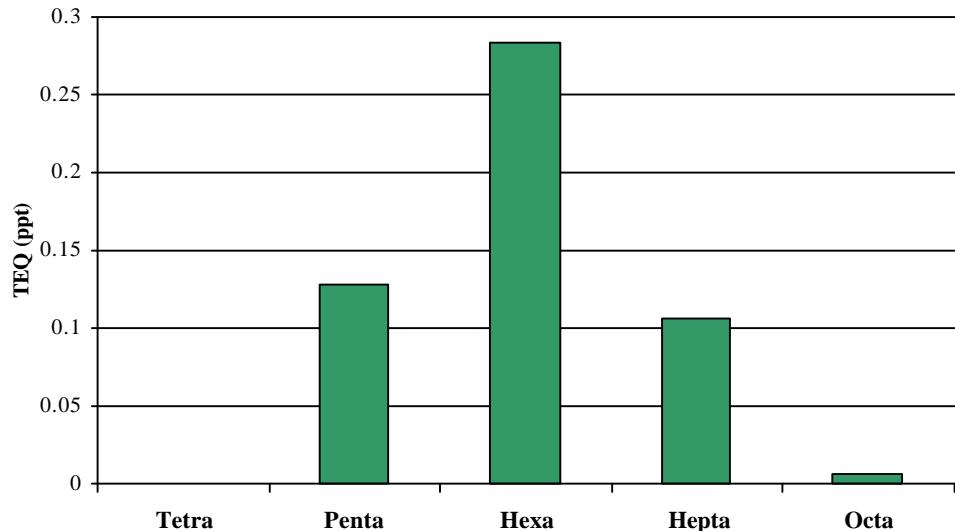
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

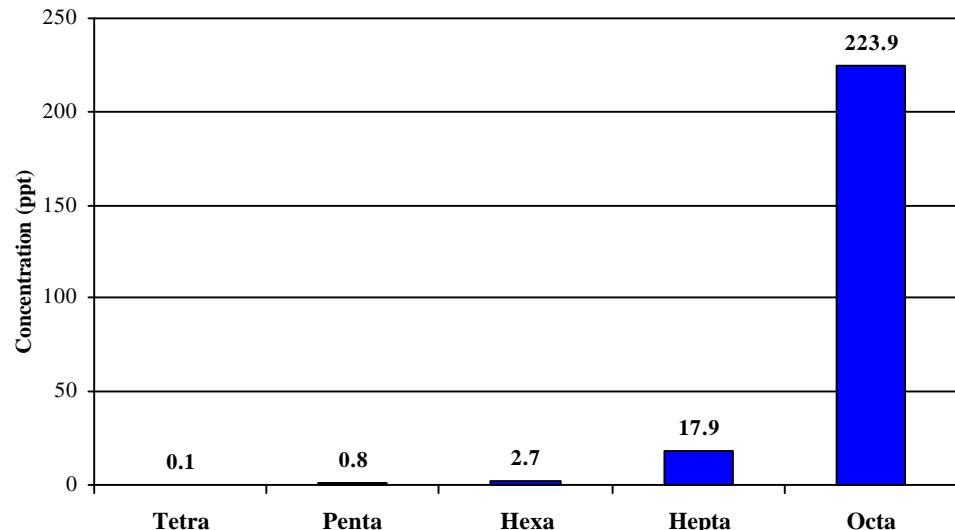


Appendix B2. Homologue Profiles

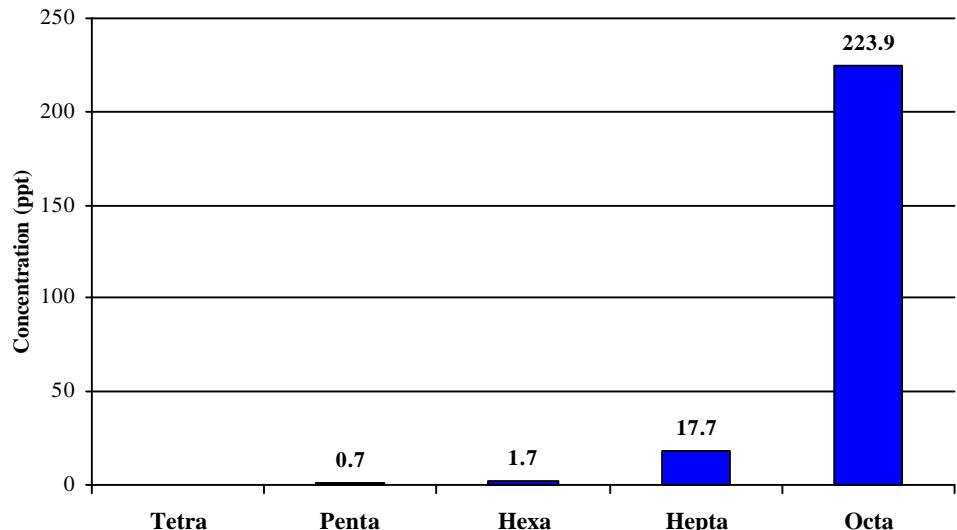
Sample 564

S33

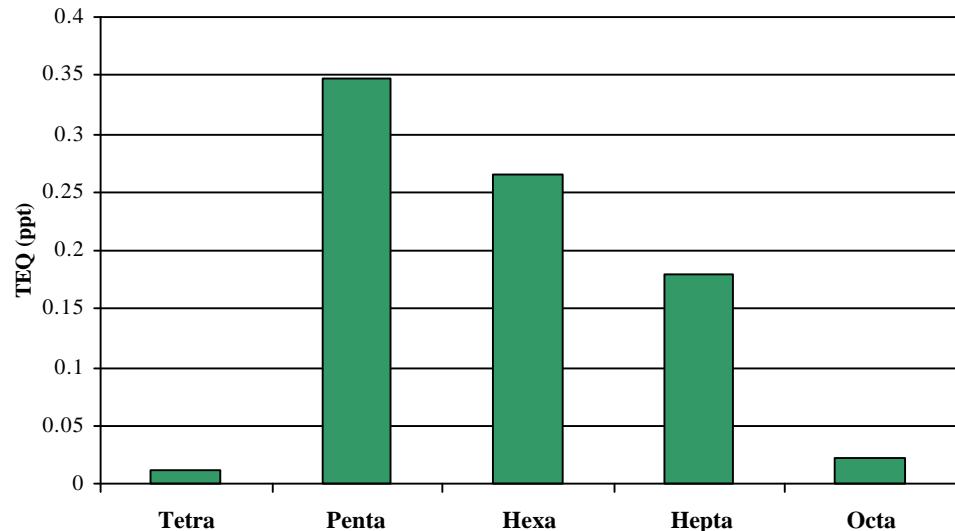
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



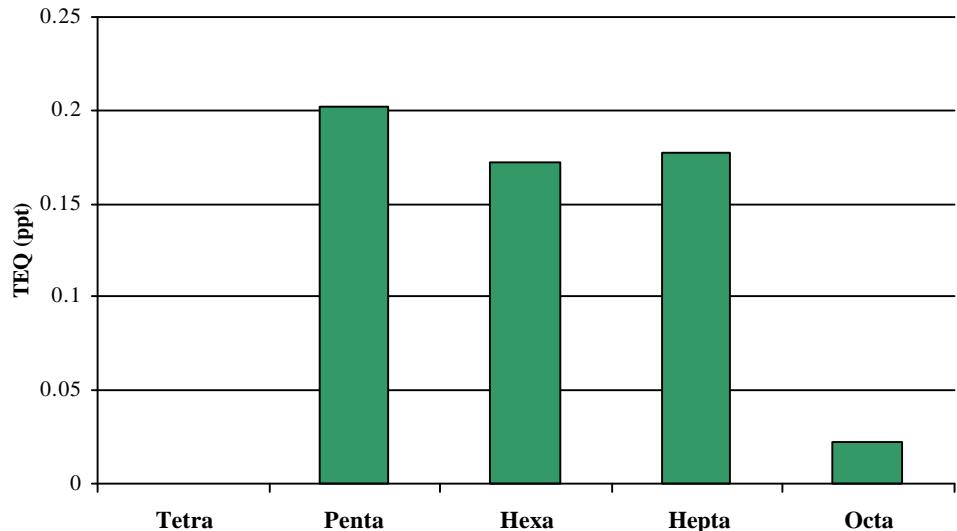
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



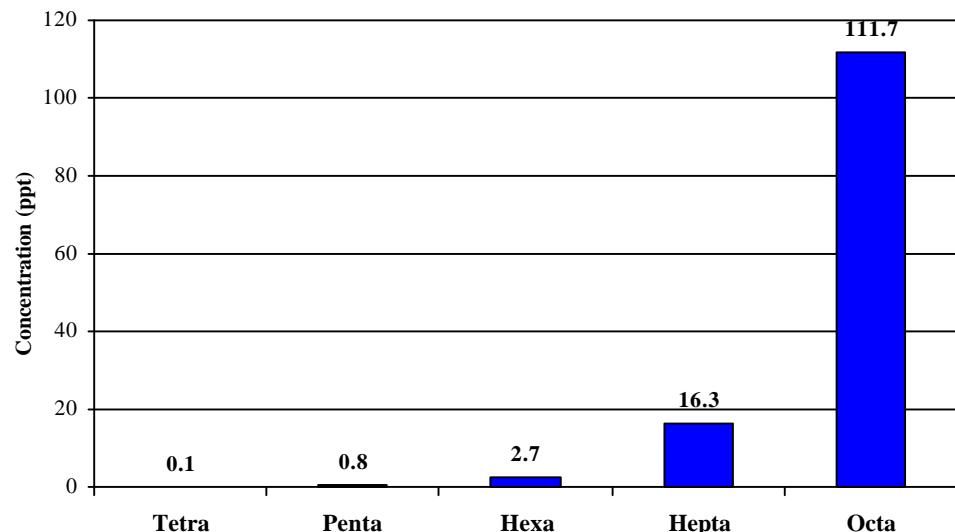
Appendix B2. Homologue Profiles

Sample 693

S34

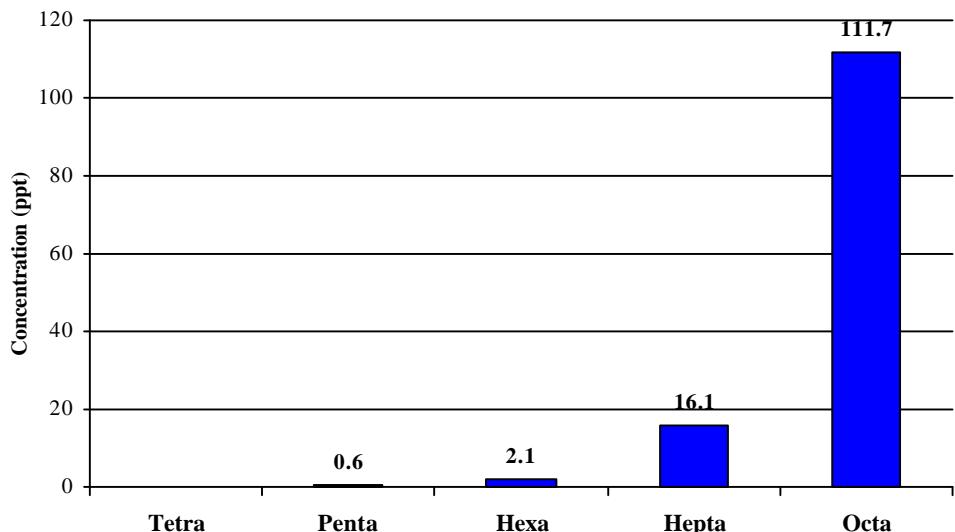
Full Concentrations: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



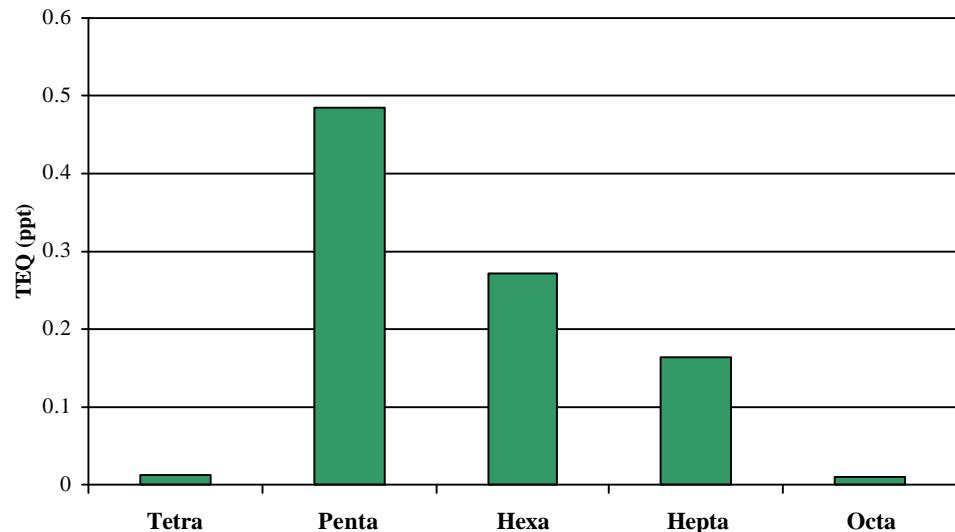
Quantitative Concentrations: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)



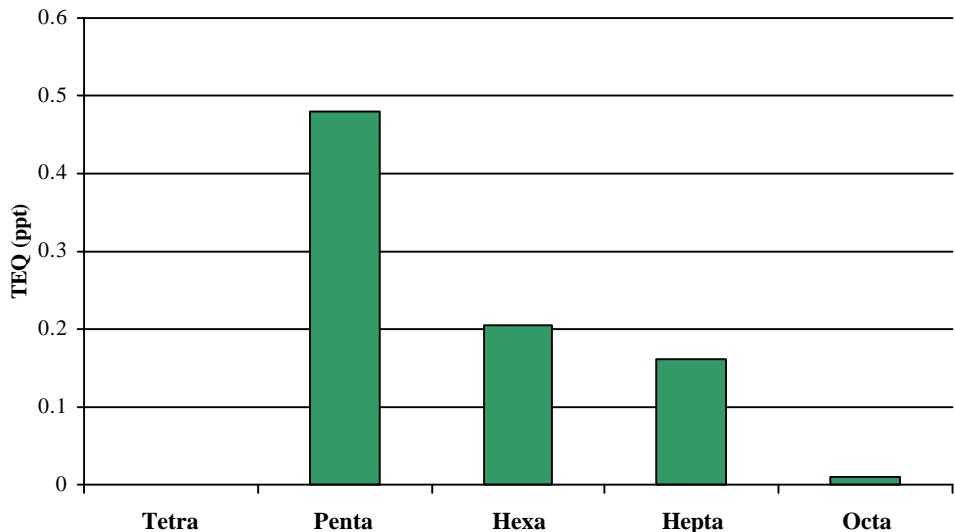
Full TEQs: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)



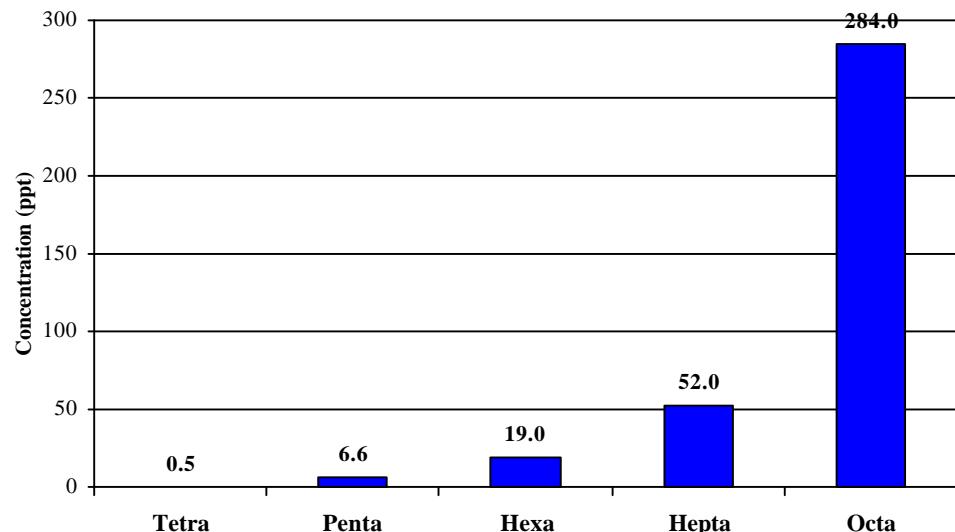
Appendix B2. Homologue Profiles

Sample 389

S35

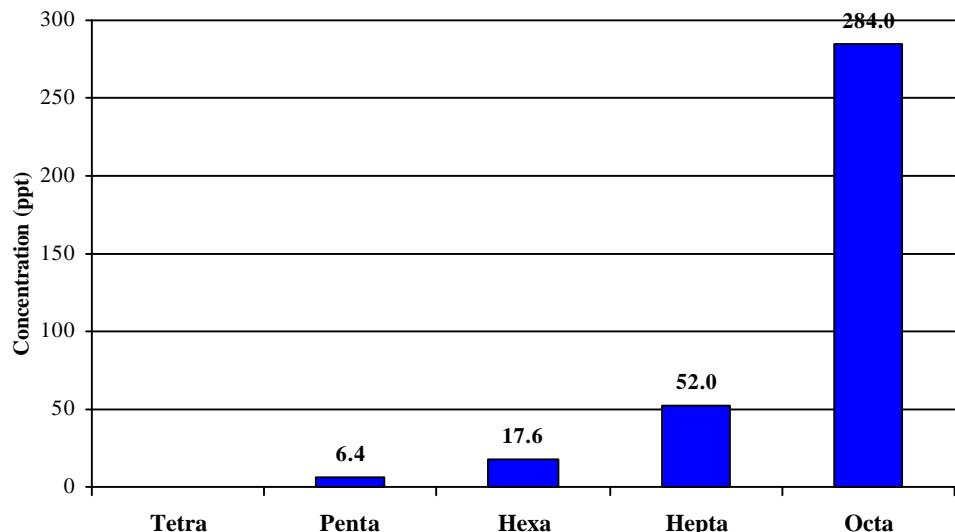
Full Concentrations: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



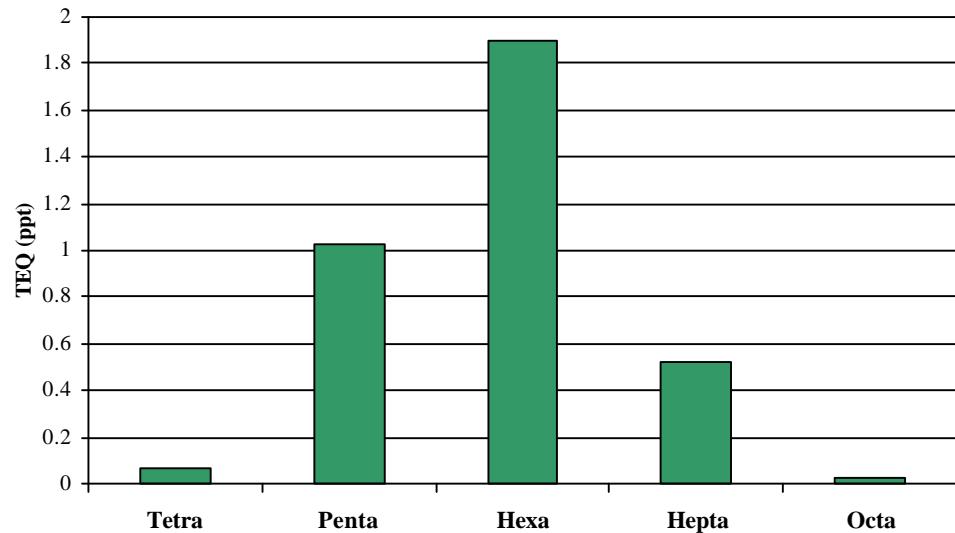
Quantitative Concentrations: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)



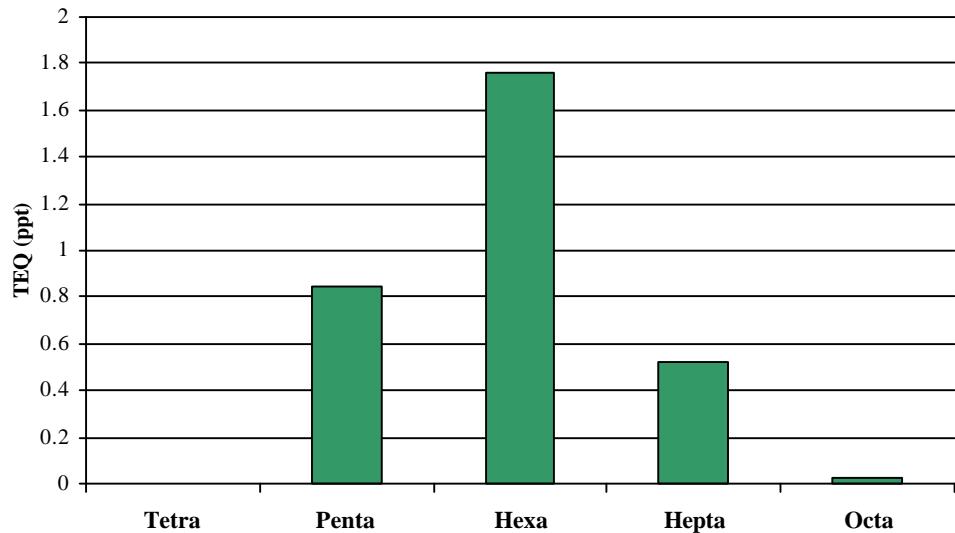
Full TEQs: Homologue Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile

(Quantitative Data Set; Values Greater Than QL)

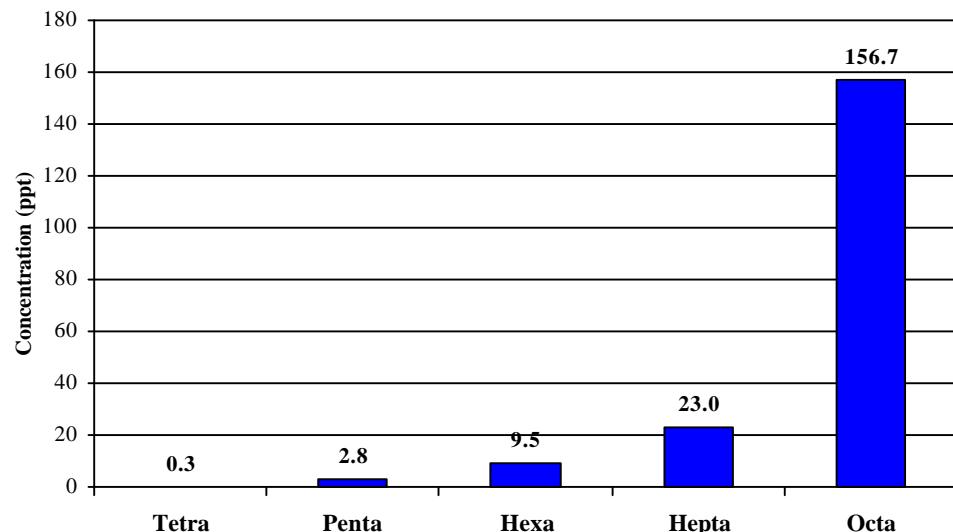


Appendix B2. Homologue Profiles

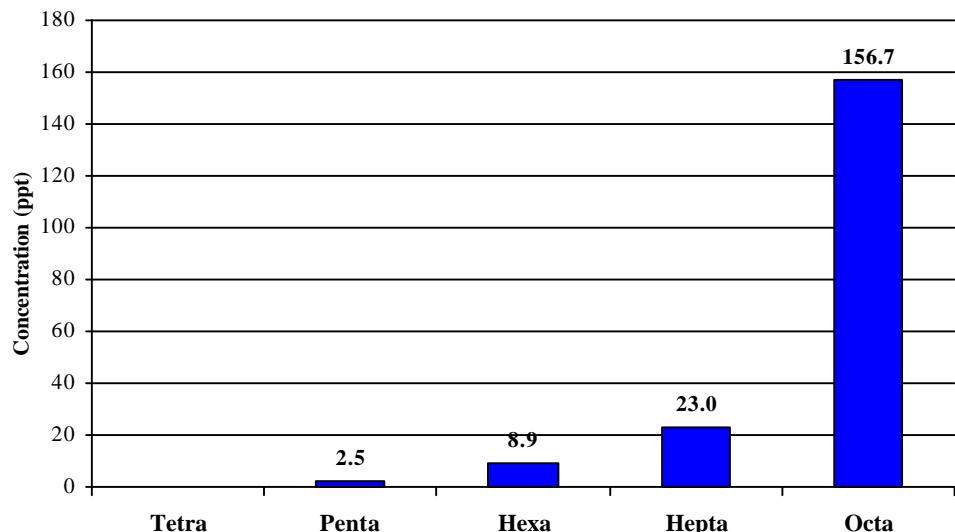
Sample 991

S36

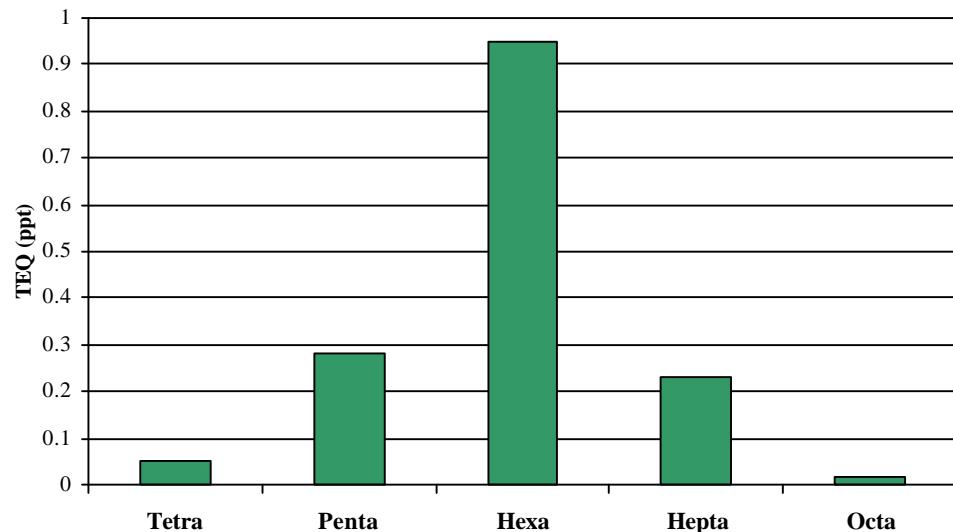
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



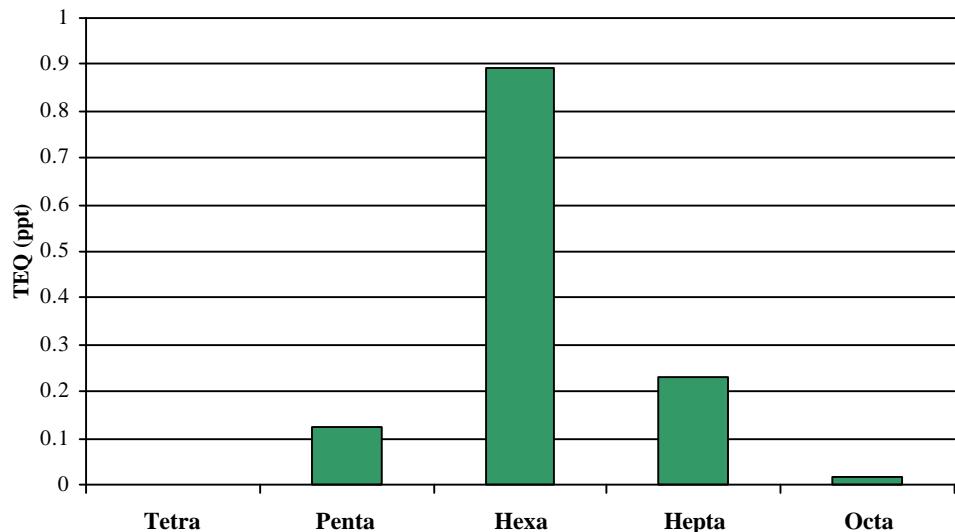
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



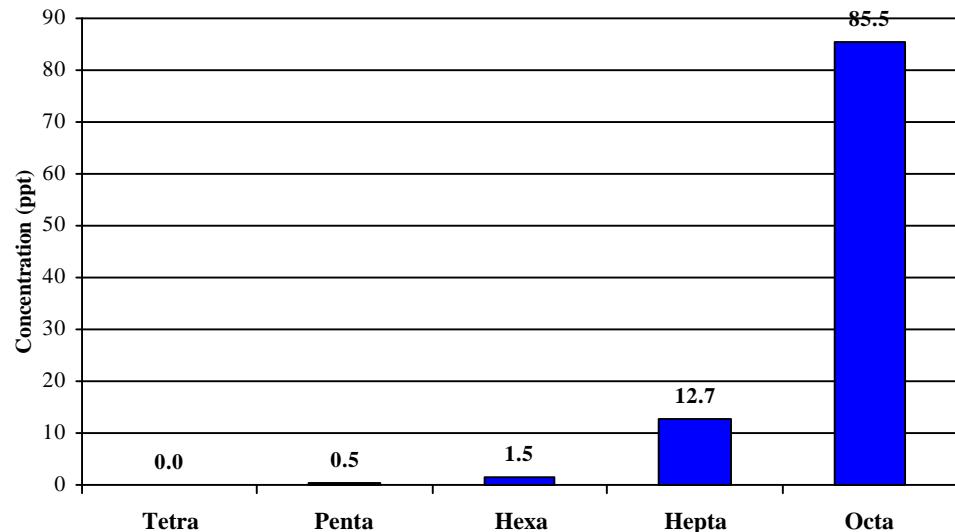
Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



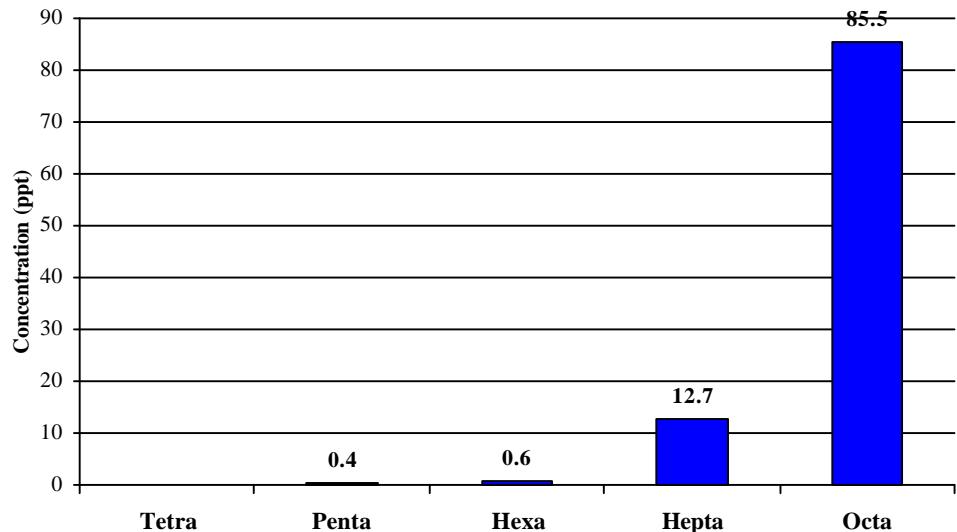
Sample 102

S4

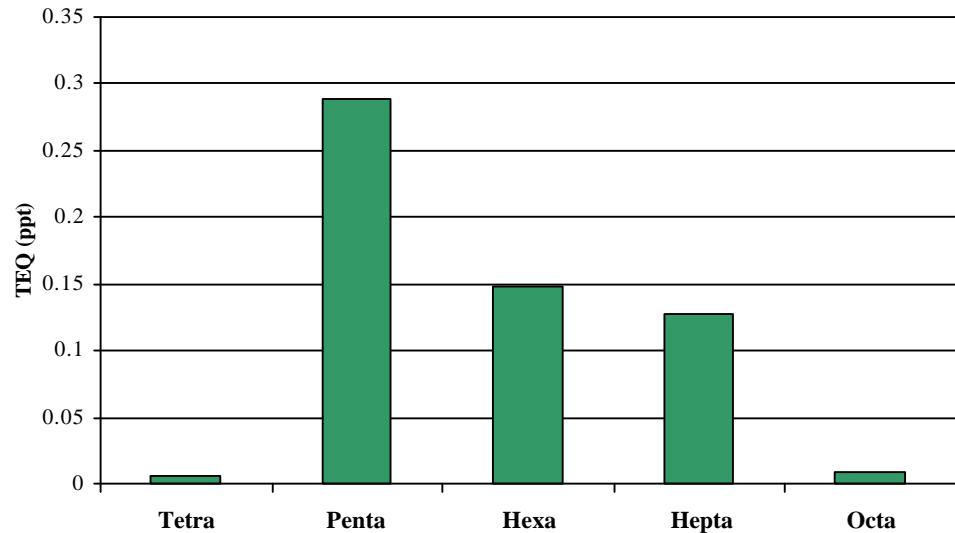
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



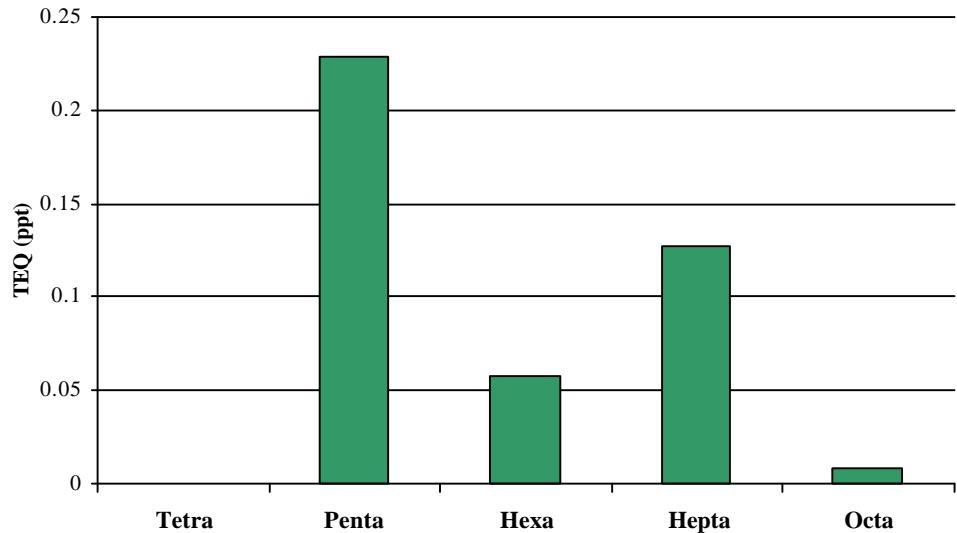
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

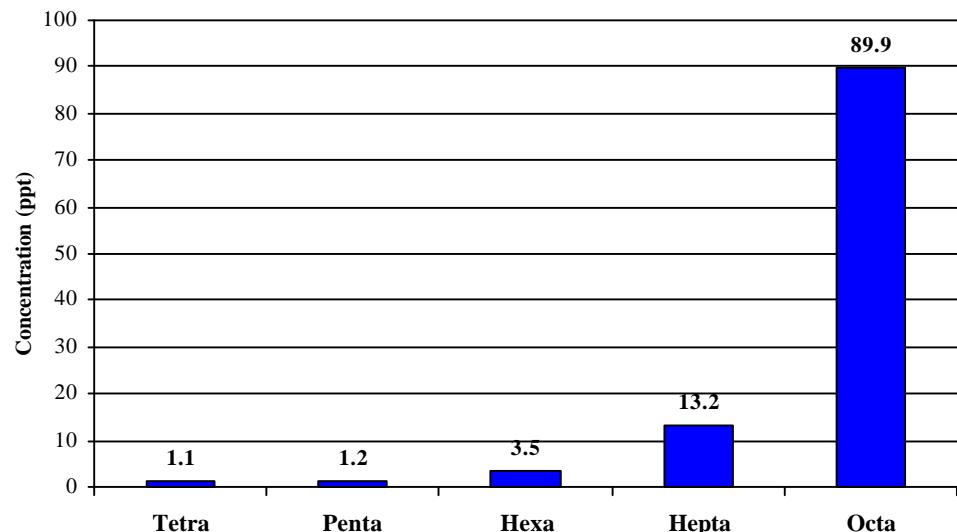


Appendix B2. Homologue Profiles

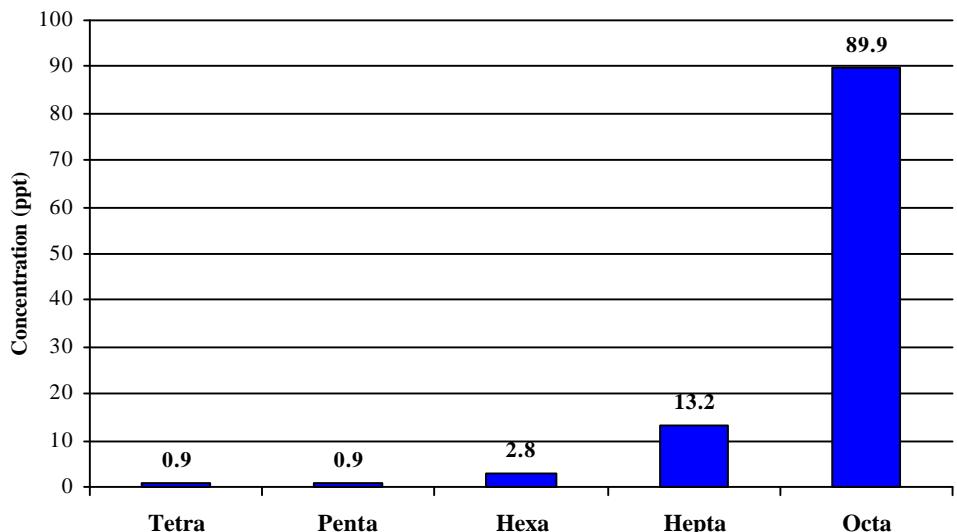
Sample 234

S5

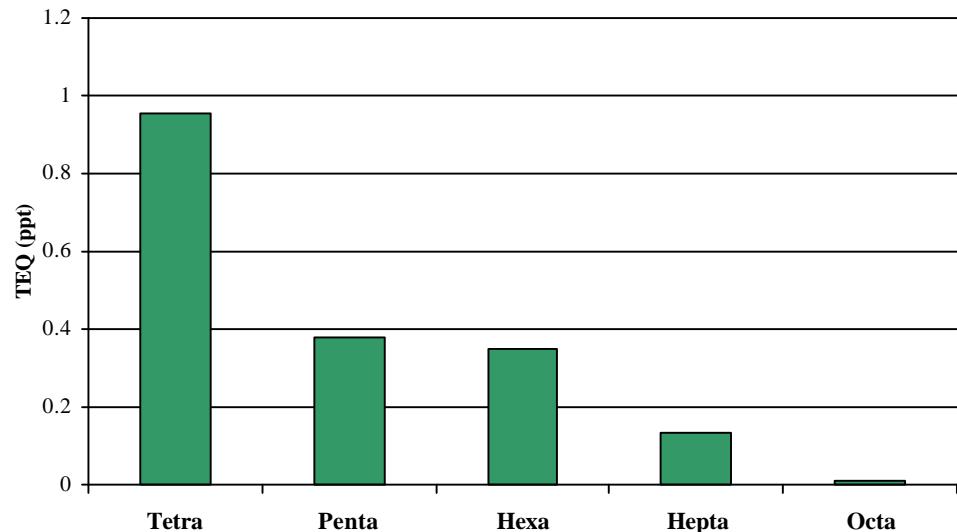
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



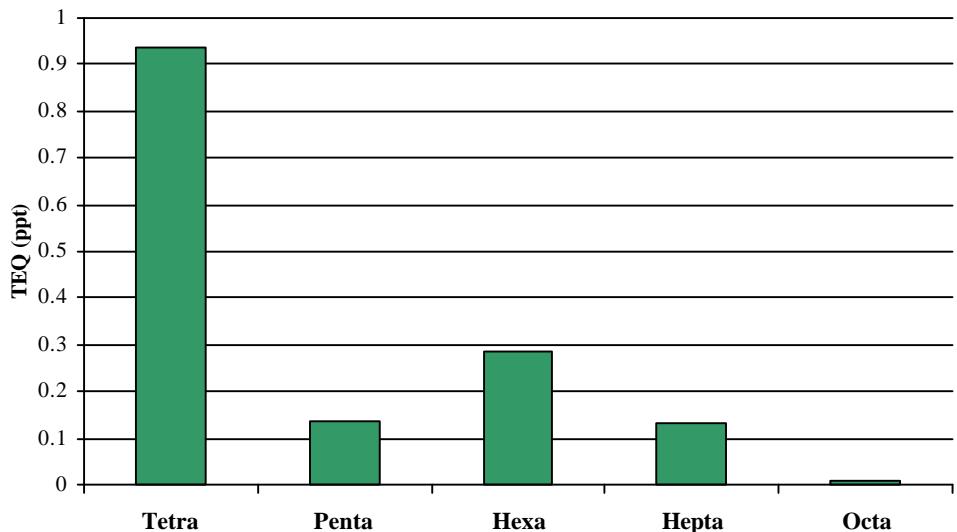
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)

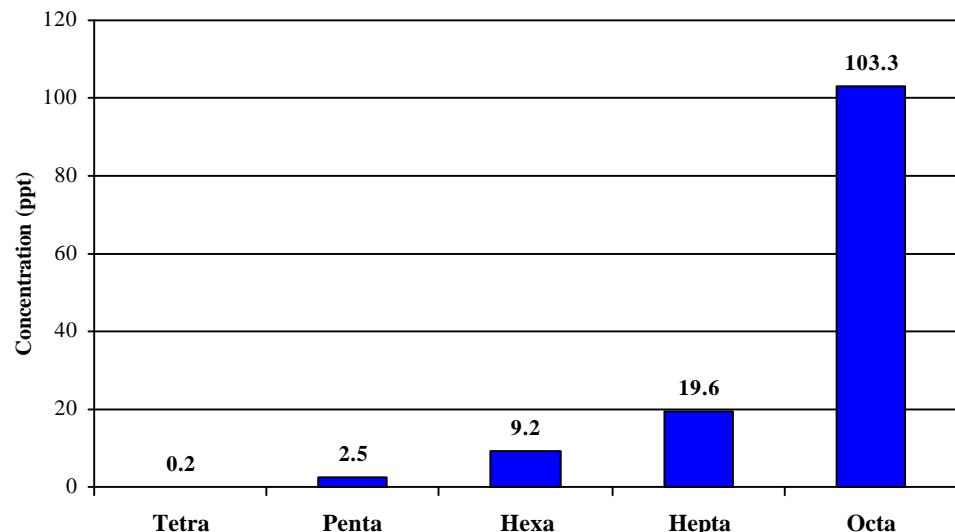


Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

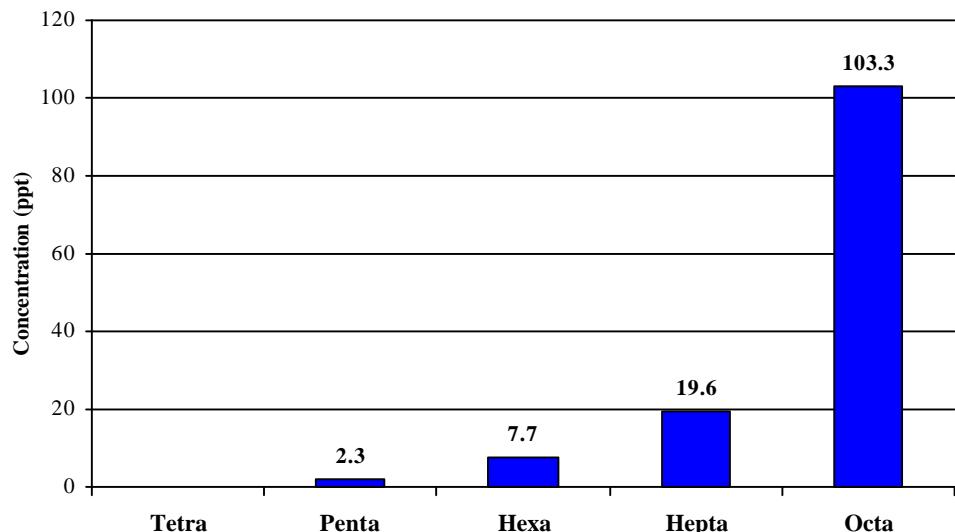


*Sample 830**S6*

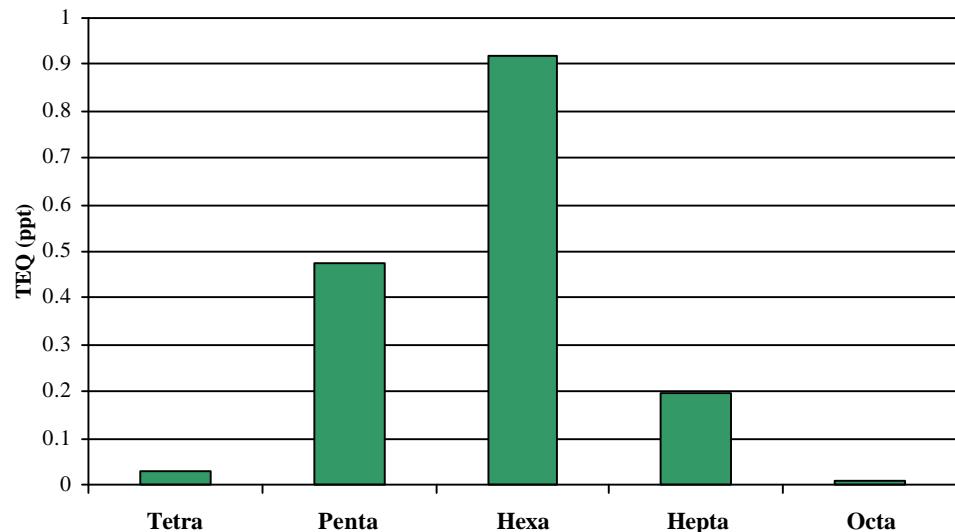
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



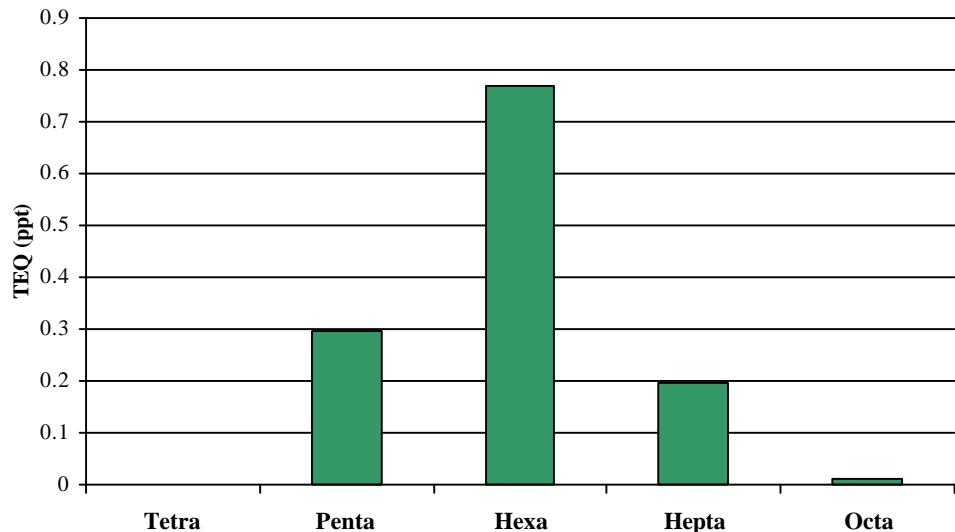
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

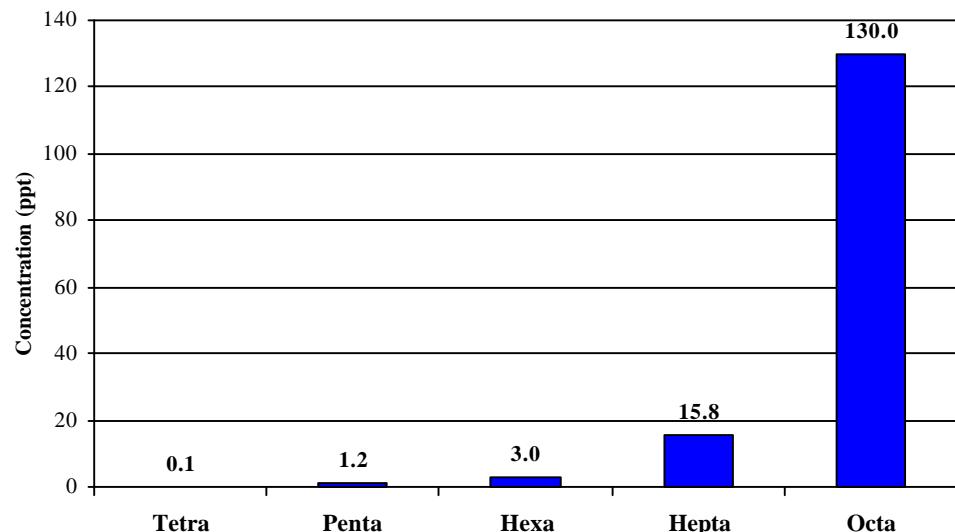


Appendix B2. Homologue Profiles

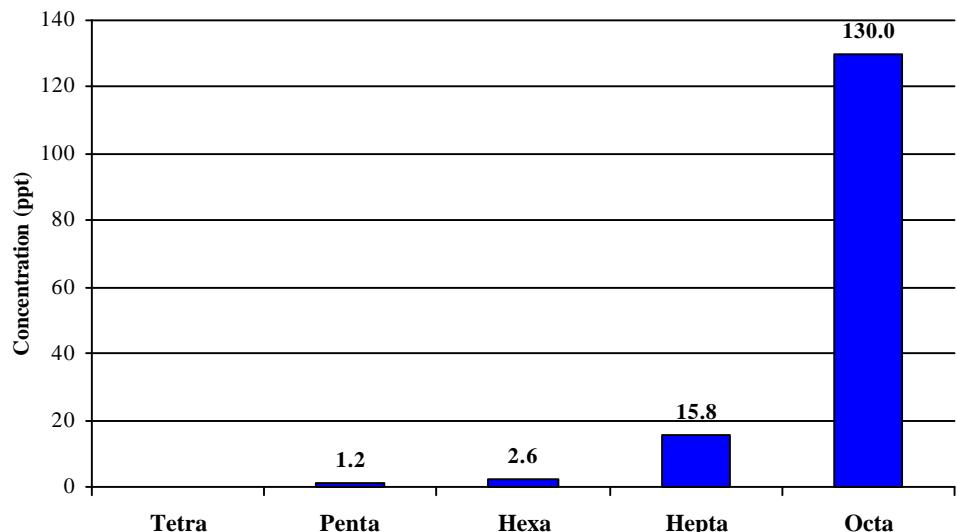
Sample 788

S7

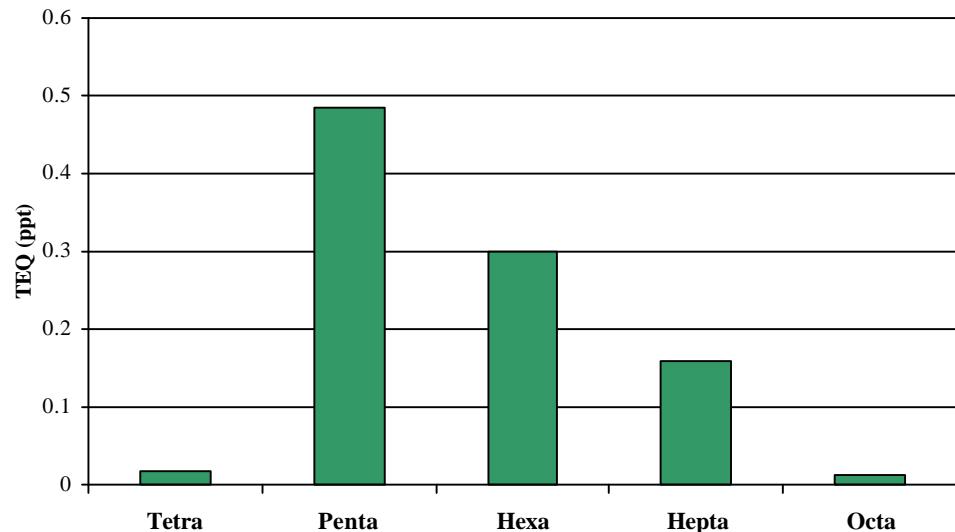
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



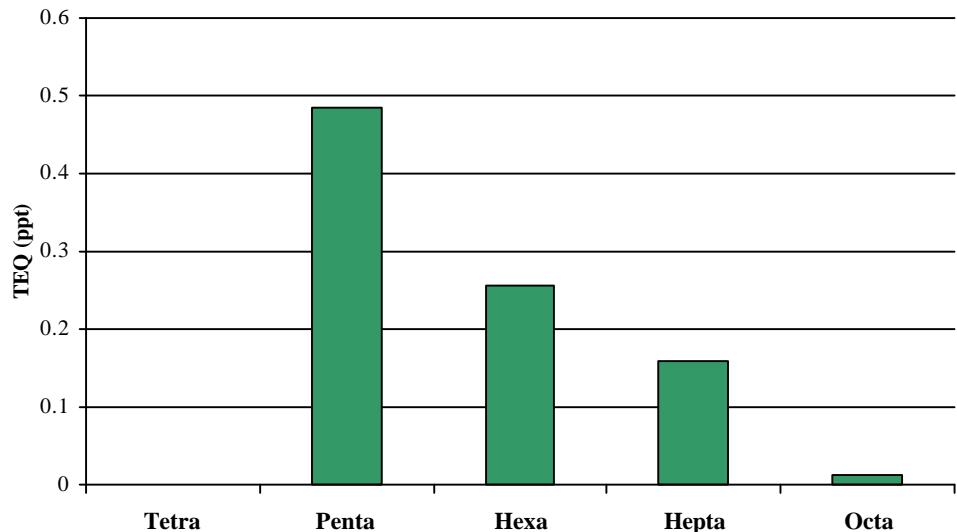
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

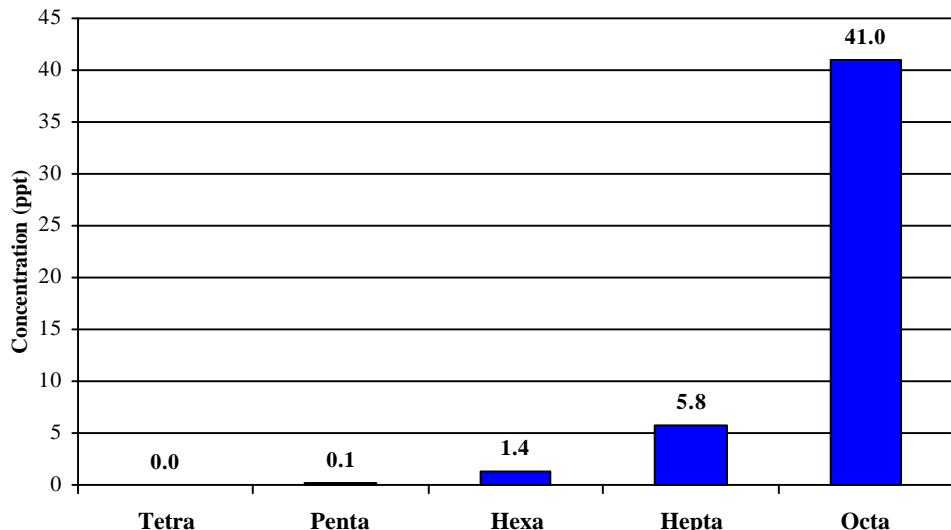


Sample 589

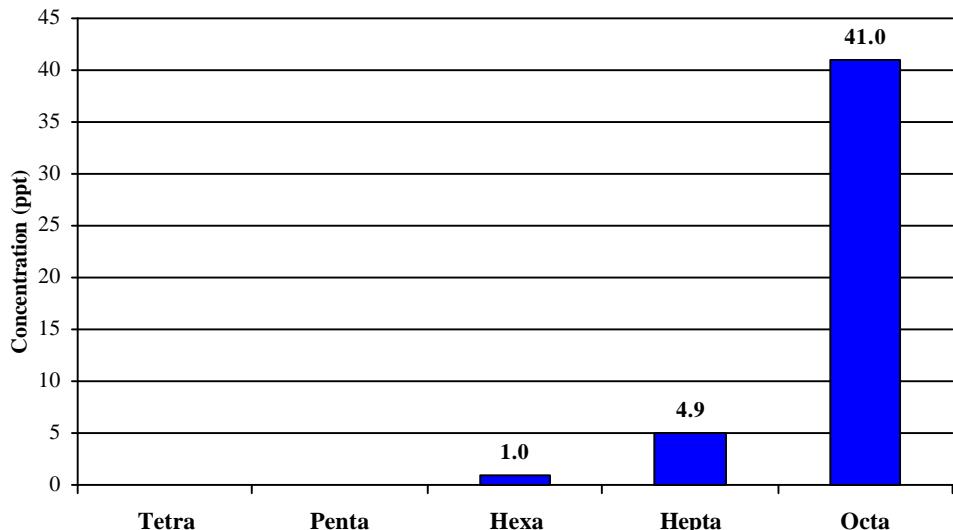
S8

Full Concentrations: Homologue Profile

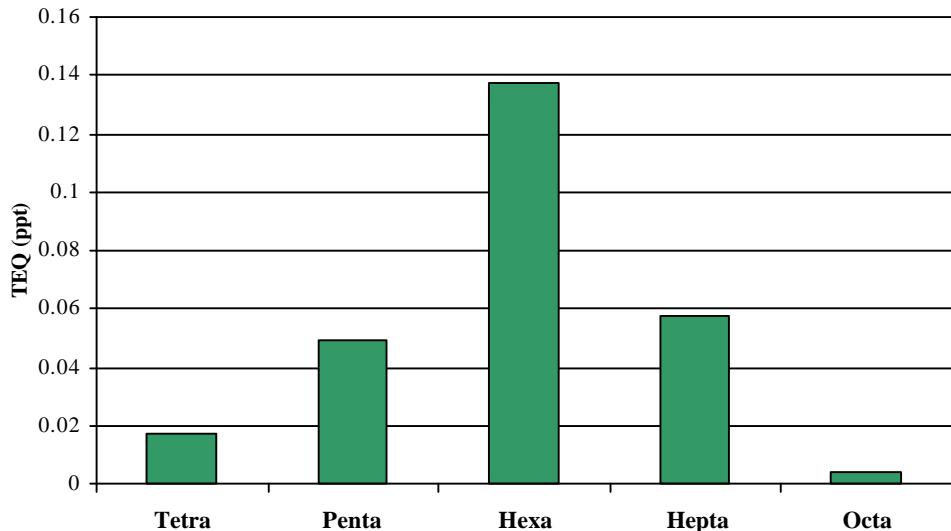
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Homologue Profile**

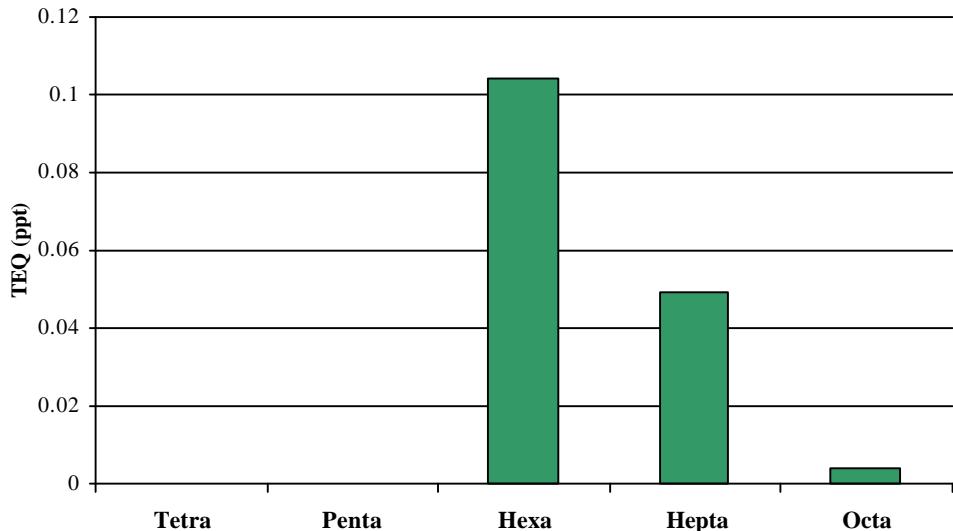
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Homologue Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Homologue Profile**

(Quantitative Data Set; Values Greater Than QL)

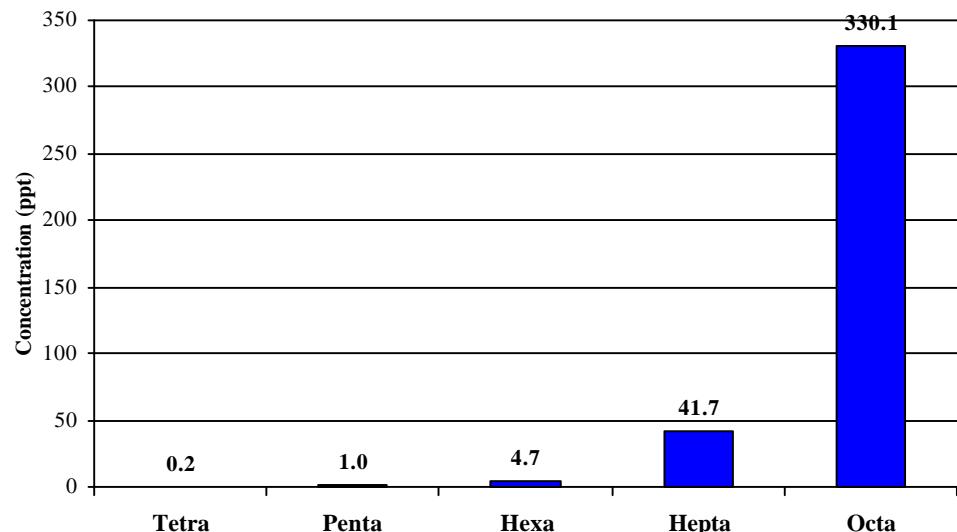


Appendix B2. Homologue Profiles

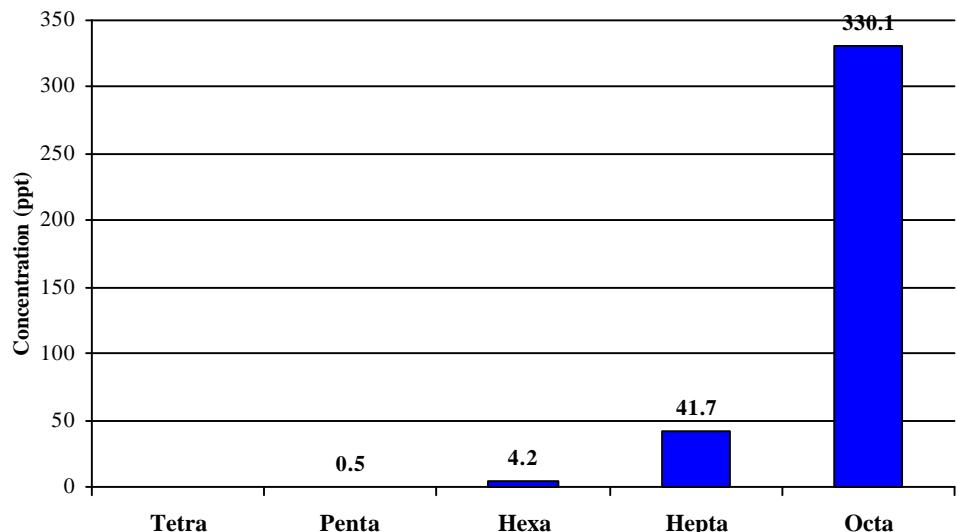
Sample 249

S9

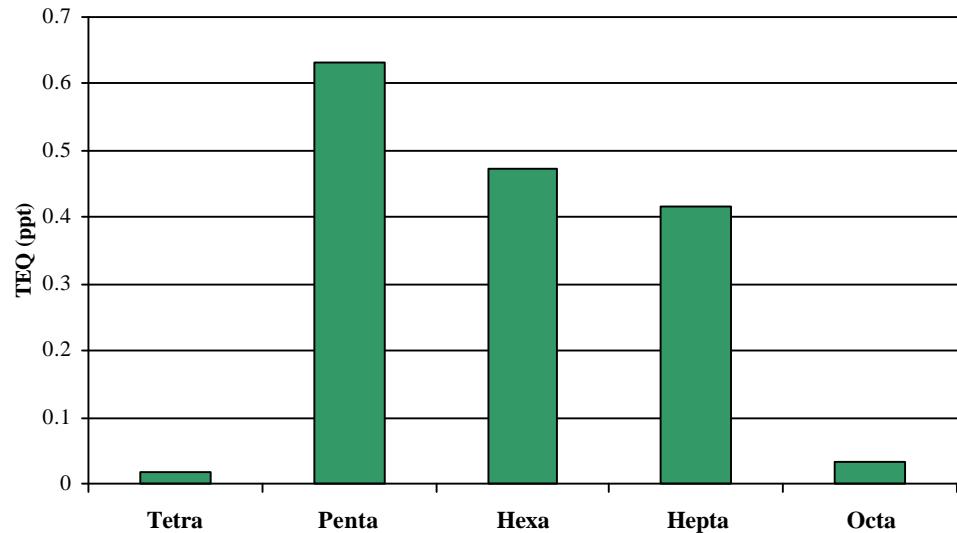
Full Concentrations: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)



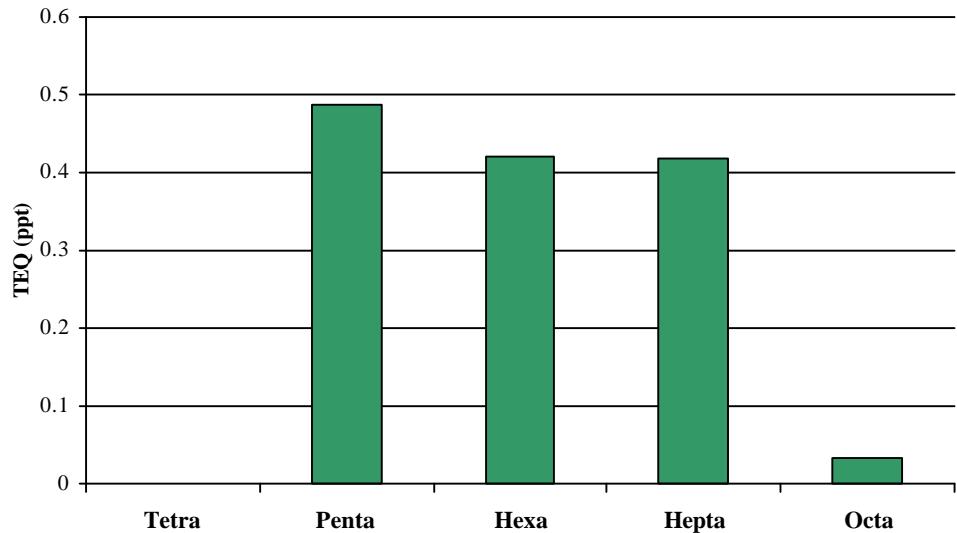
Quantitative Concentrations: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)

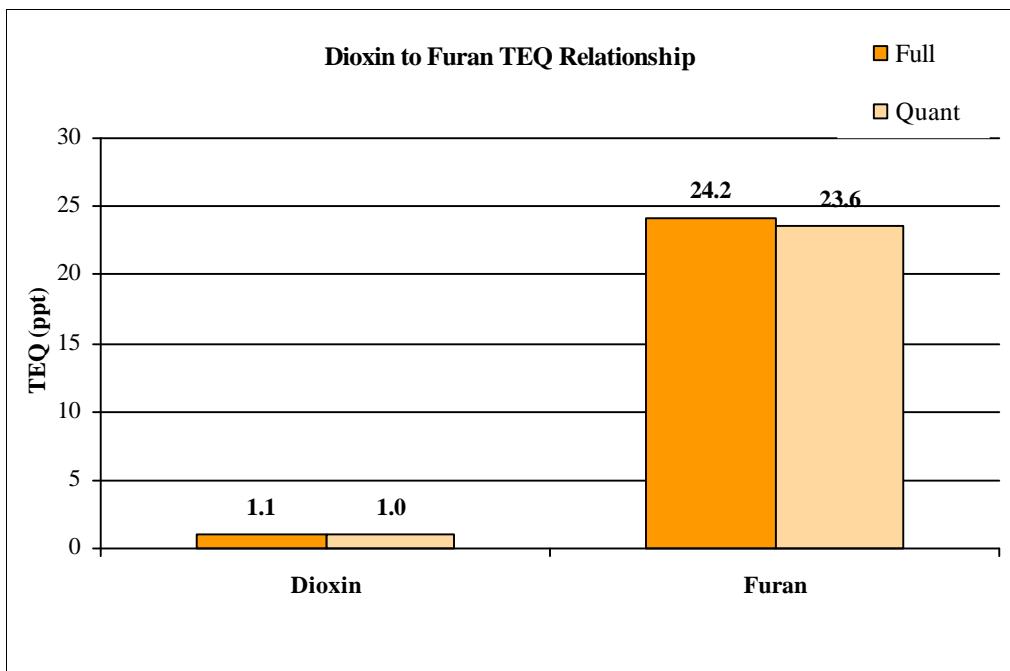
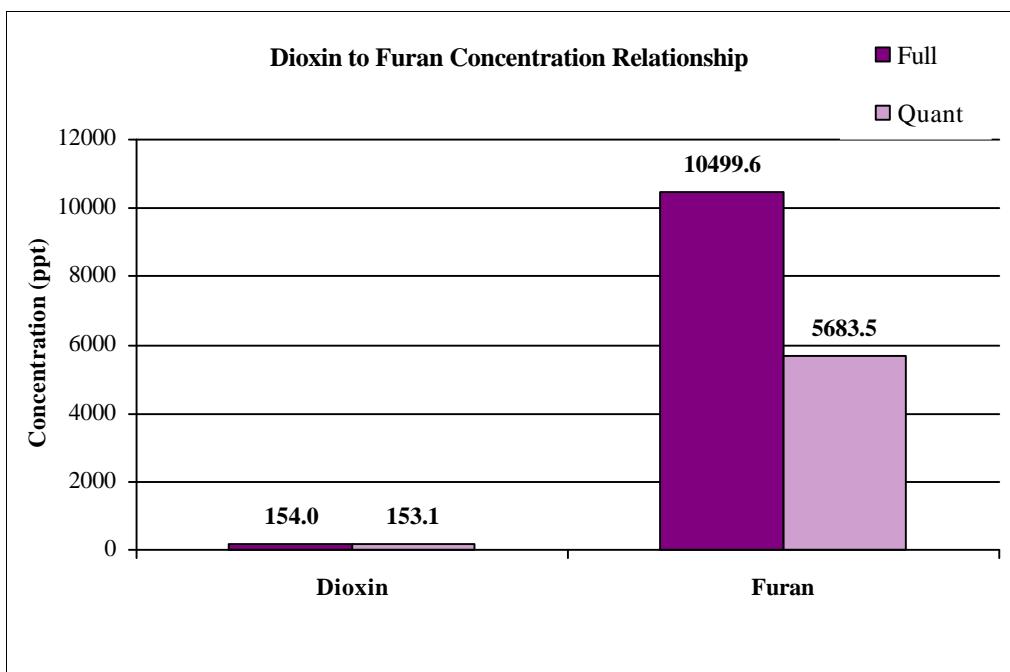


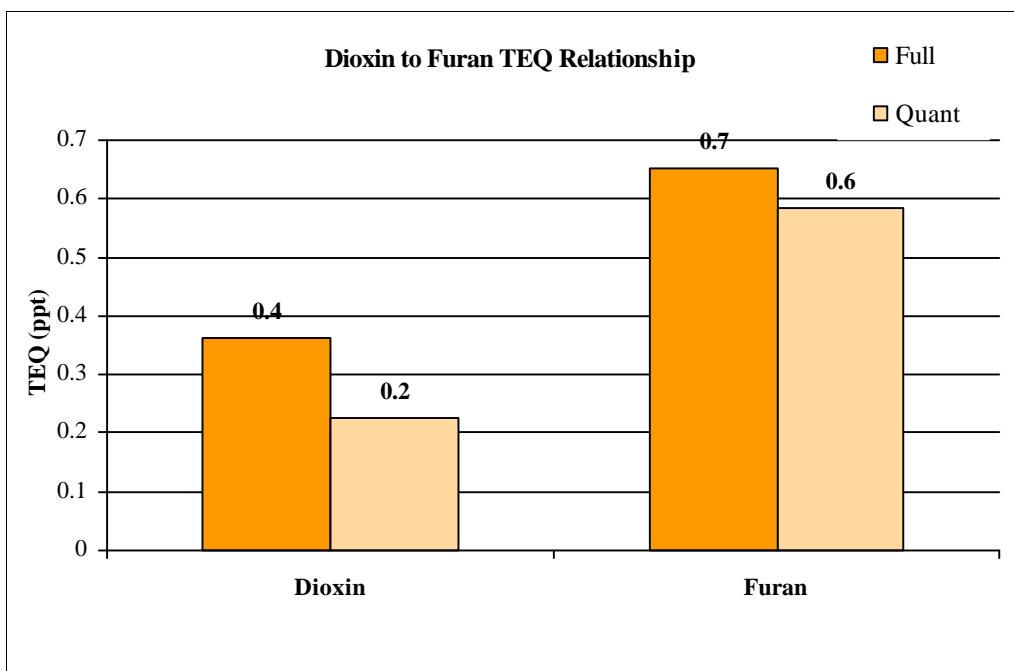
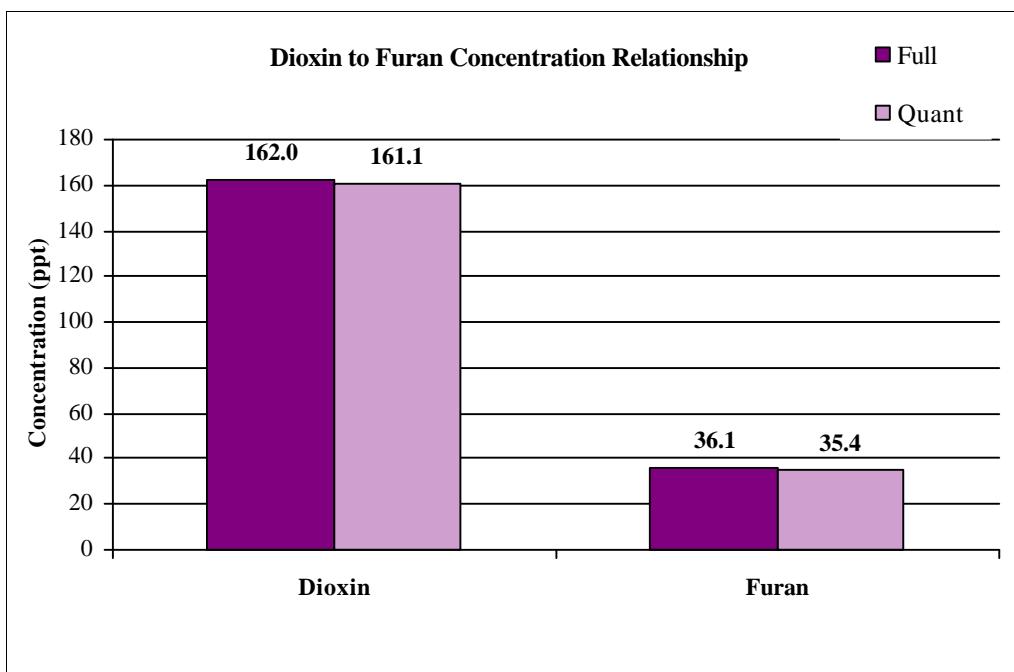
Full TEQs: Homologue Profile
(Full Data Set With Proxies = 1/2 DL)

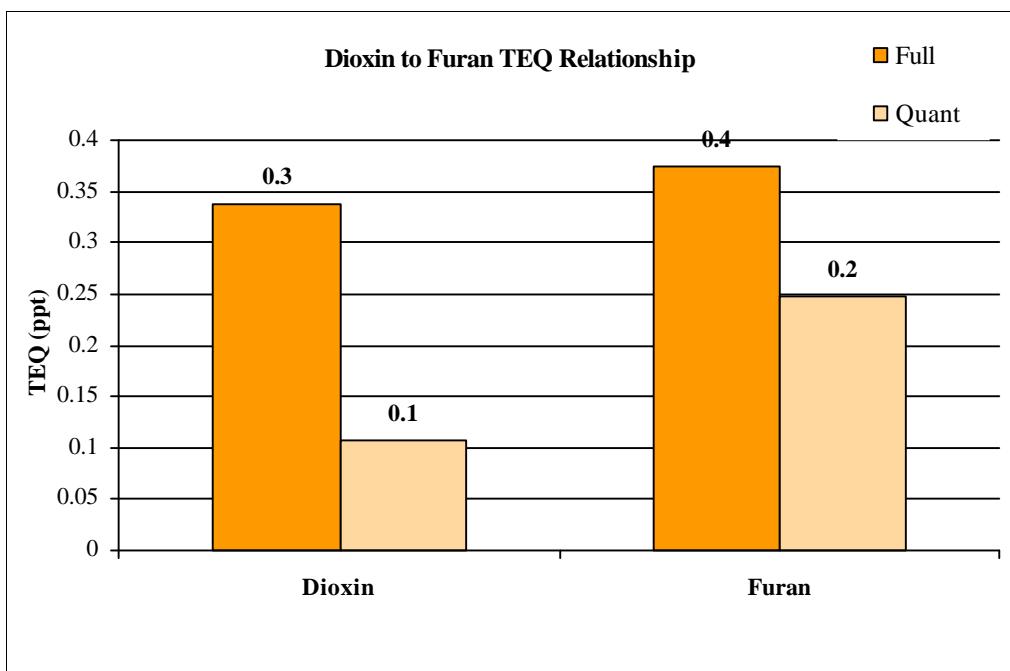
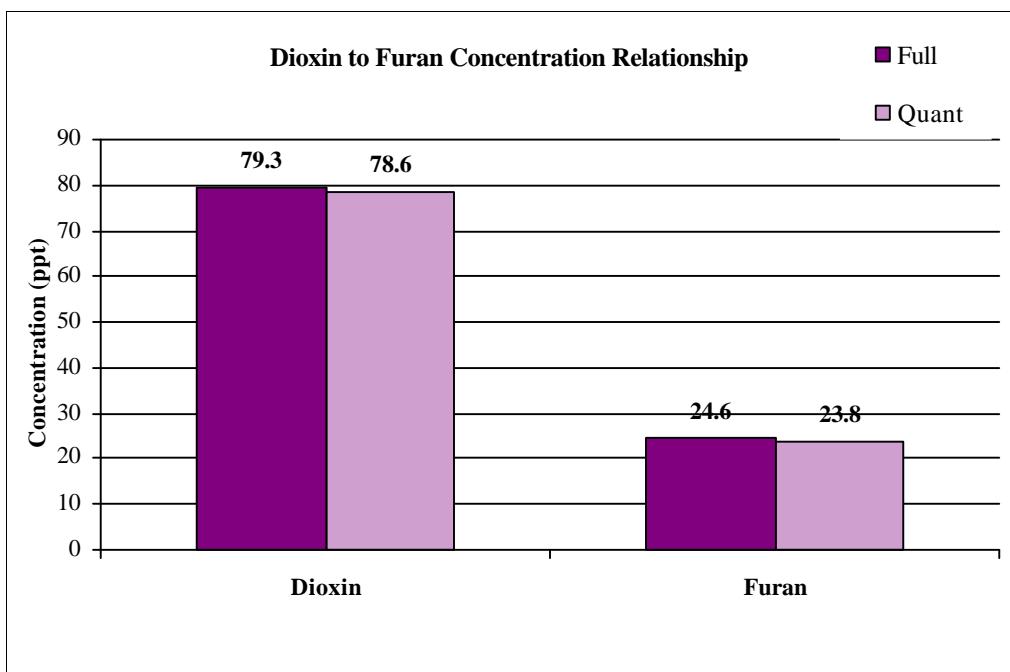


Quantitative TEQs: Homologue Profile
(Quantitative Data Set; Values Greater Than QL)



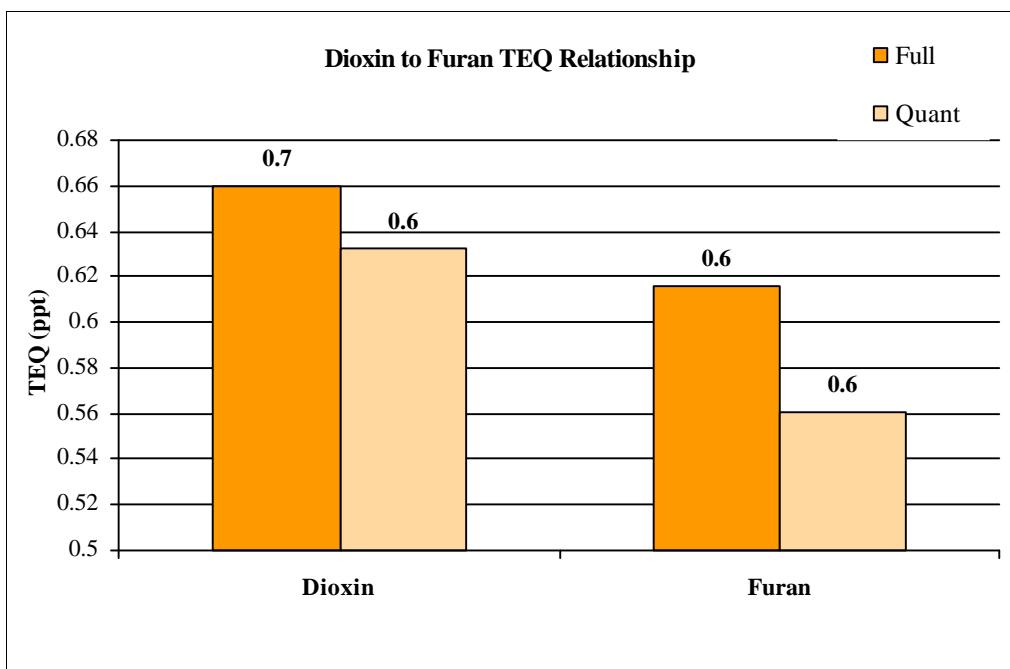
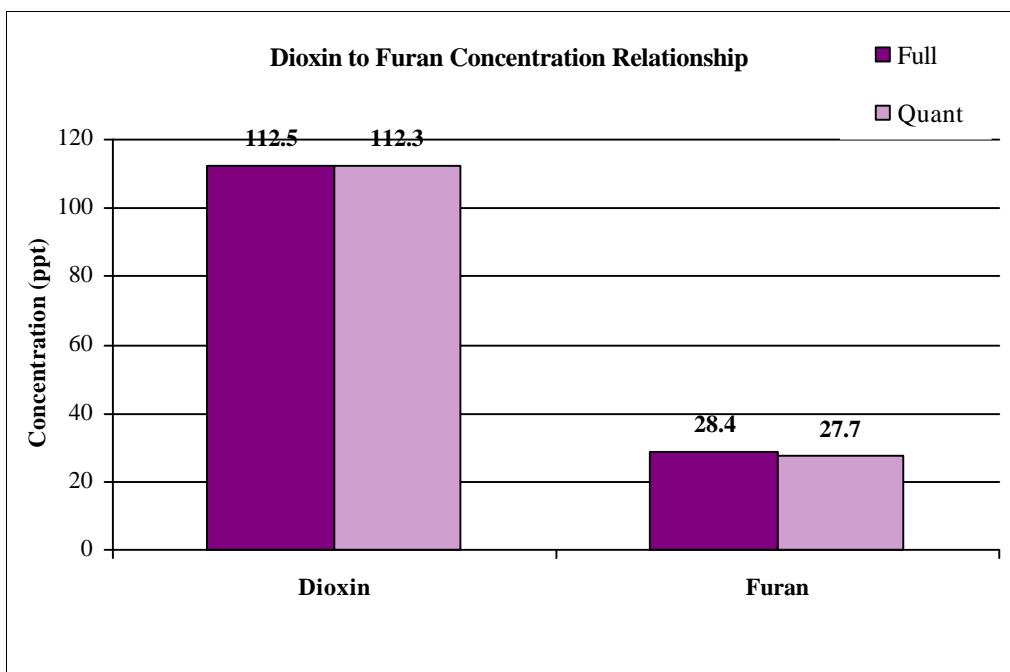
*Sample 463**S1*

*Sample 318**S11*

*Sample 567**SI2*

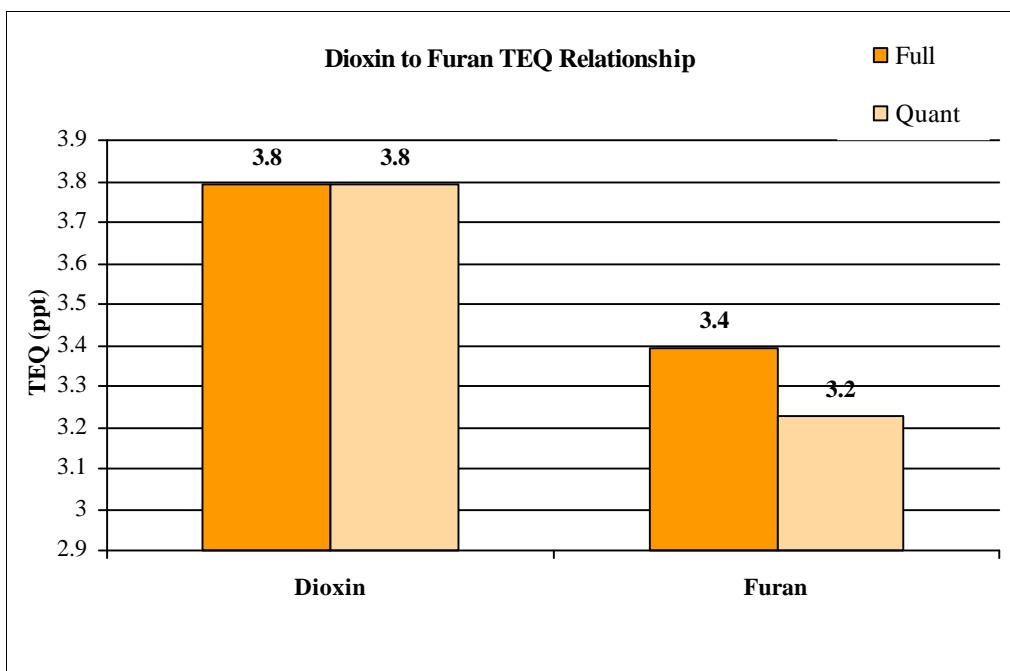
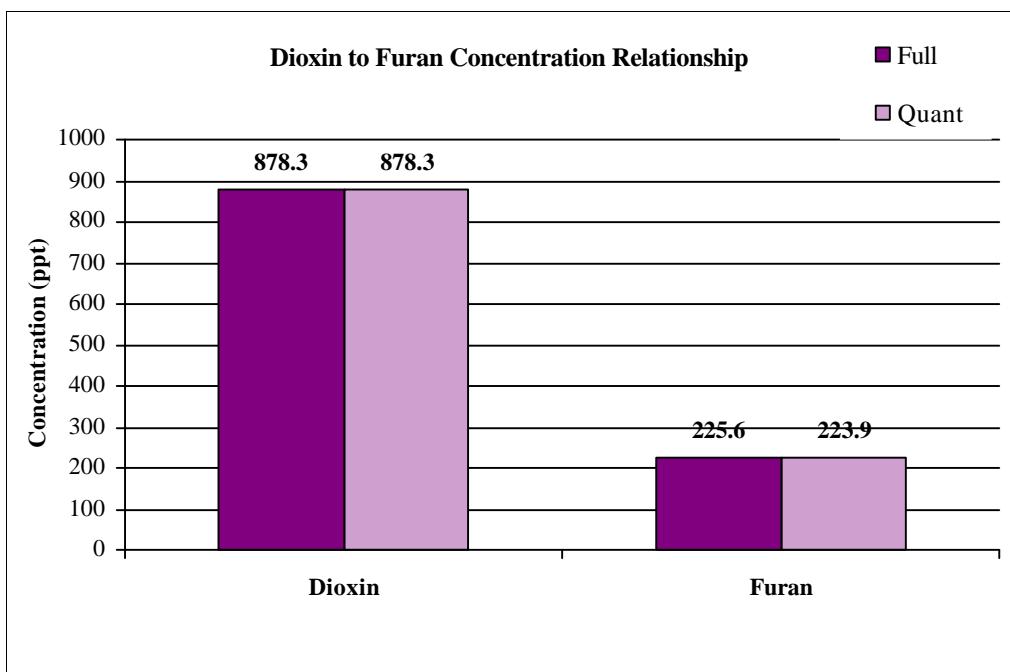
Sample 187

S19



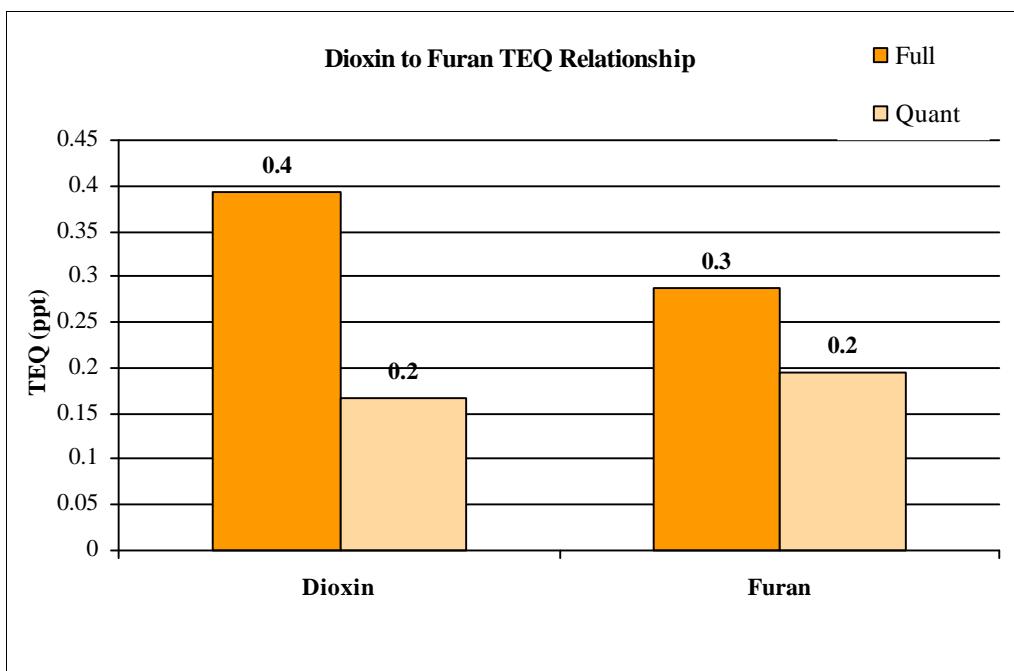
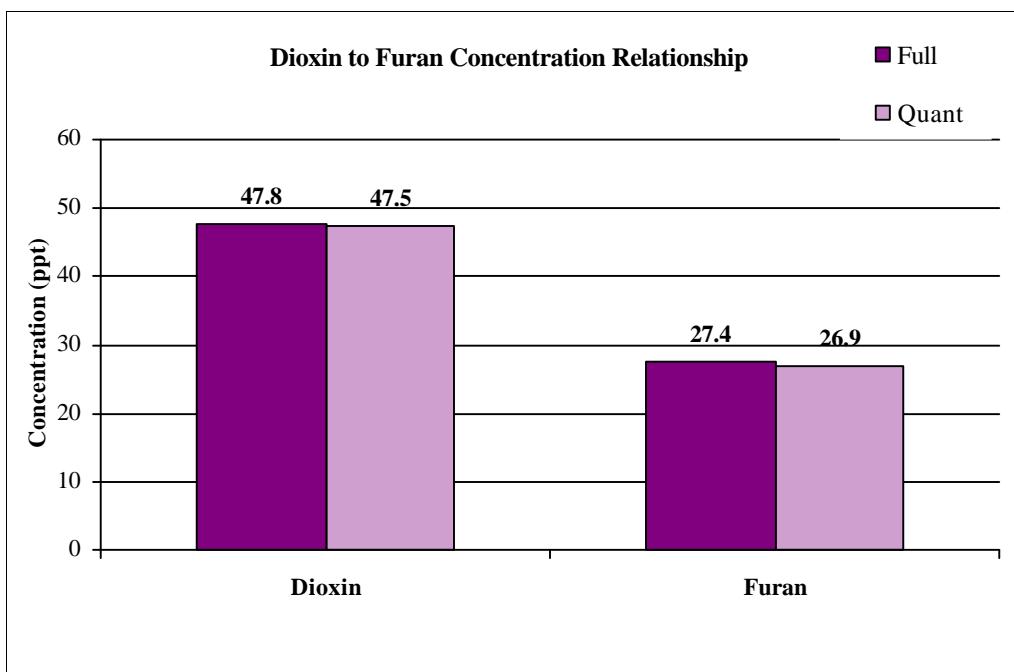
Sample 429

S2



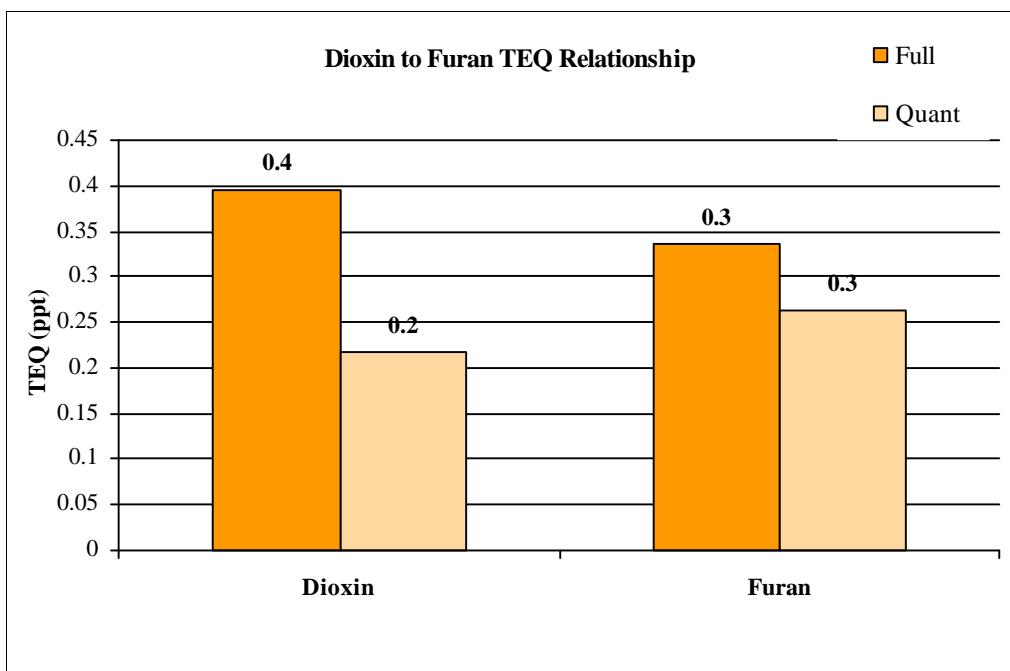
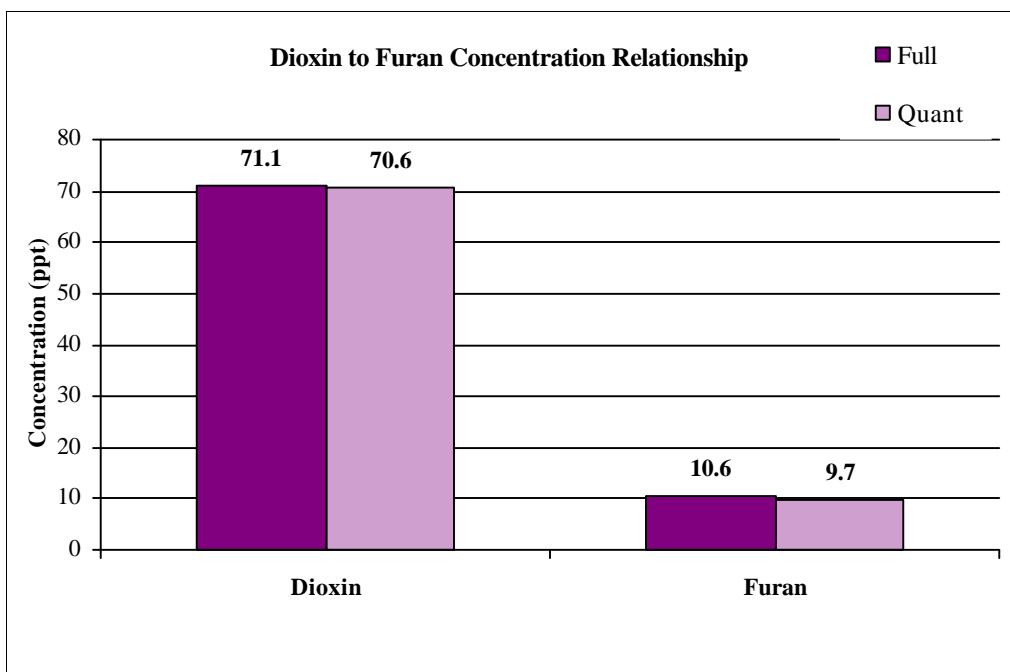
Sample 291

S20



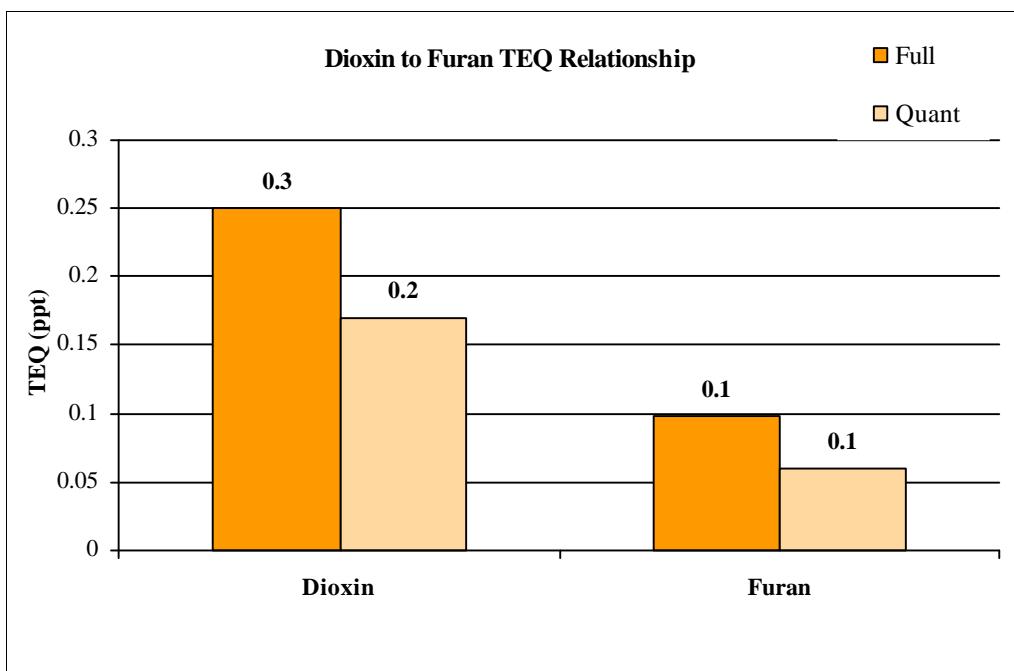
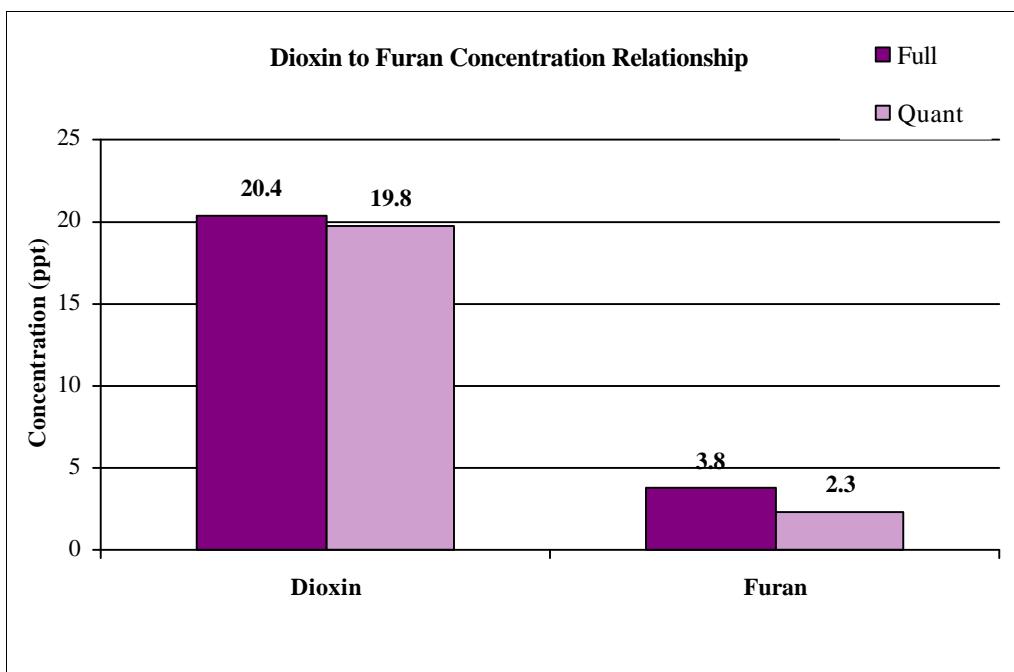
Sample 644

S22



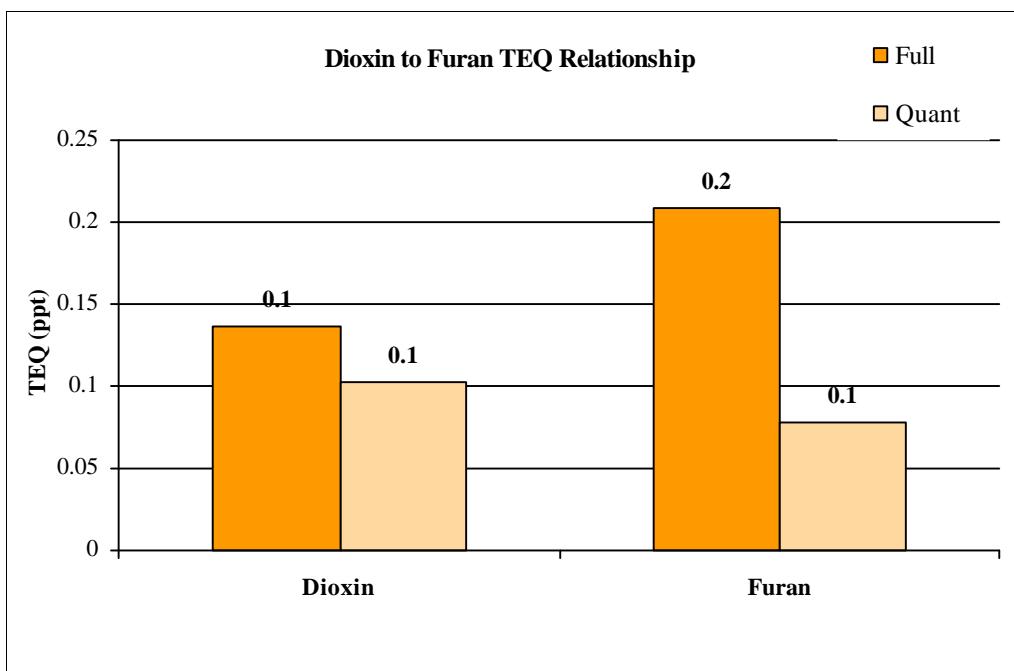
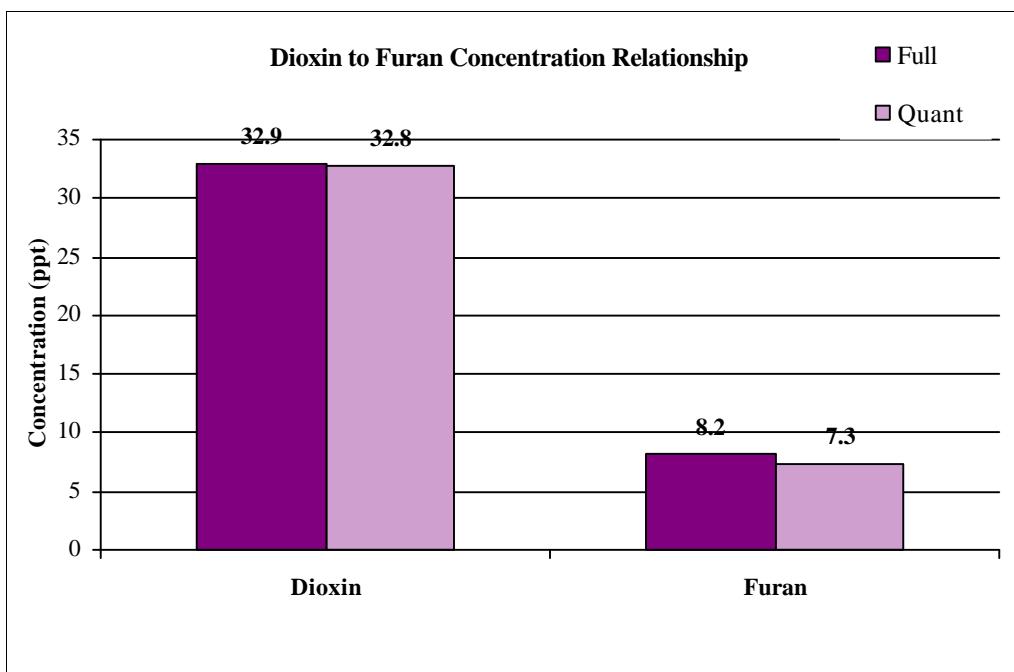
Sample 521

S23



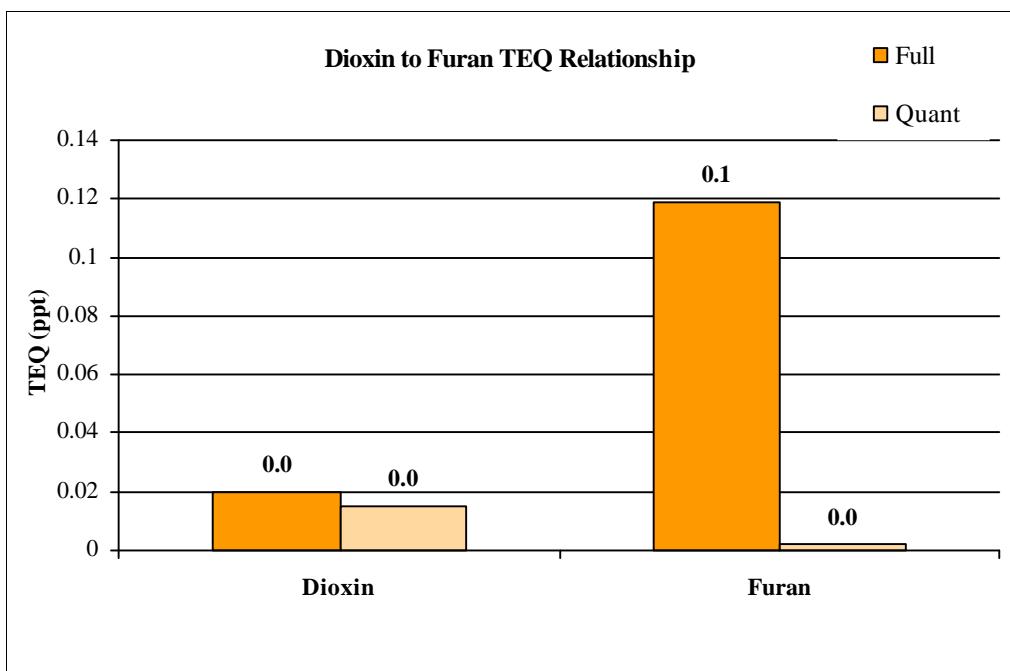
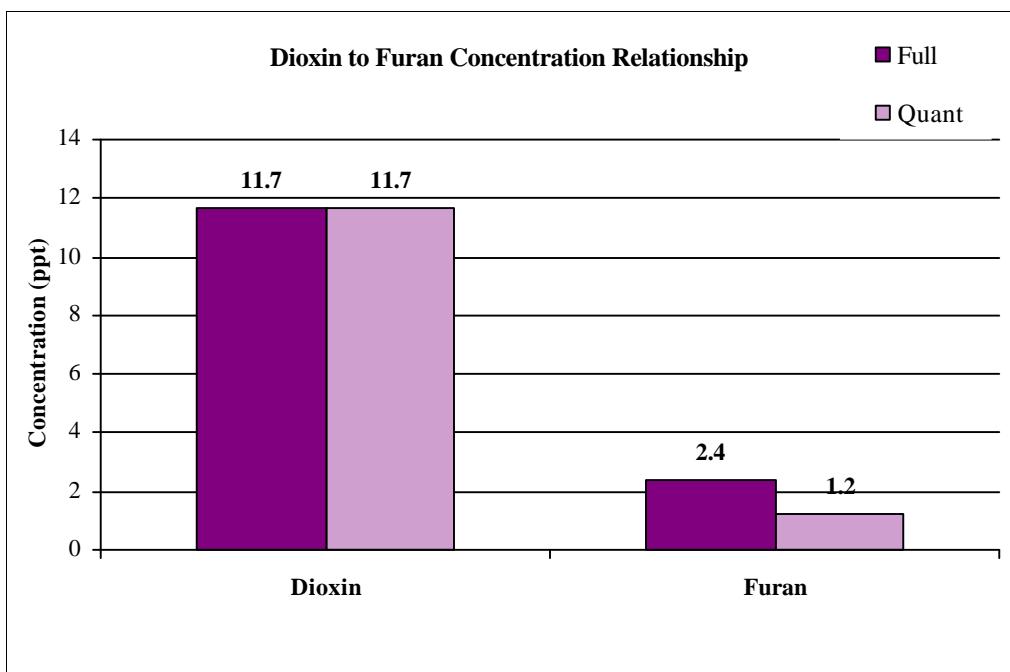
Sample 385

S24



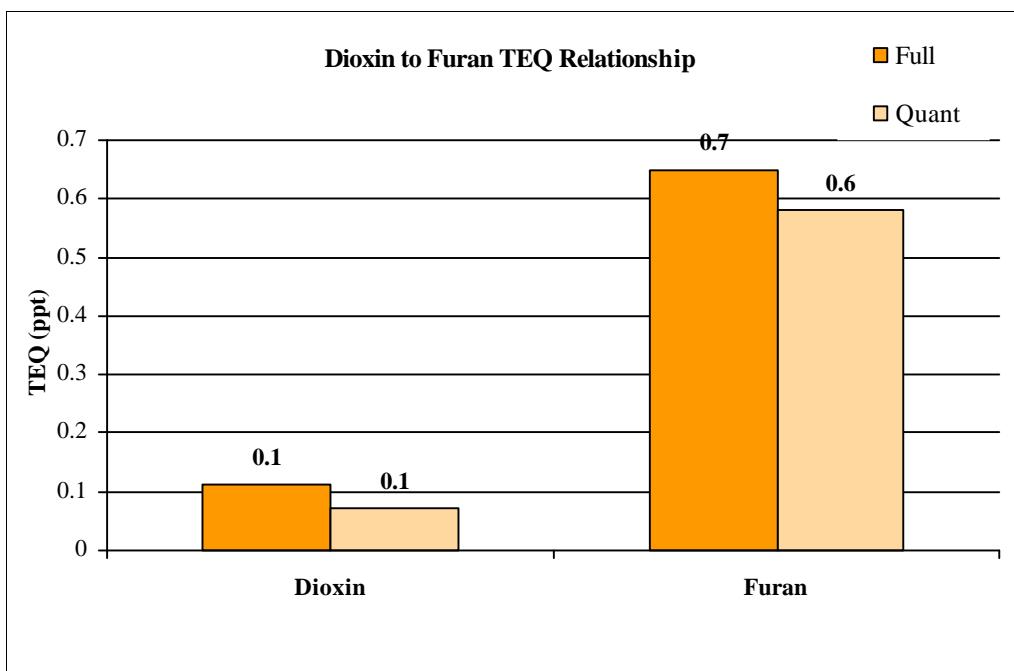
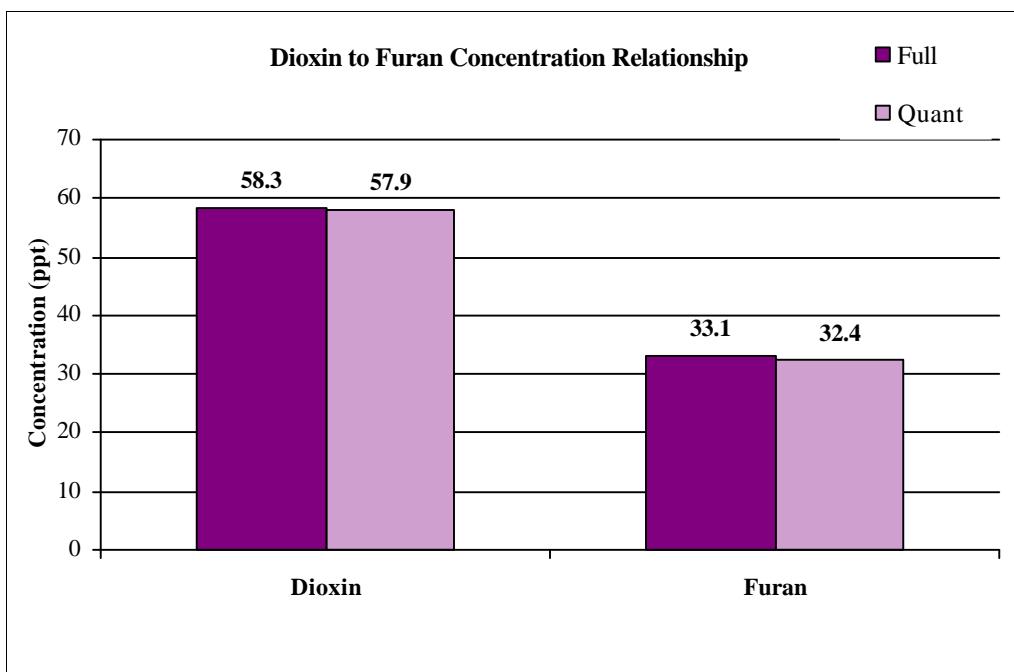
Sample 847

S25



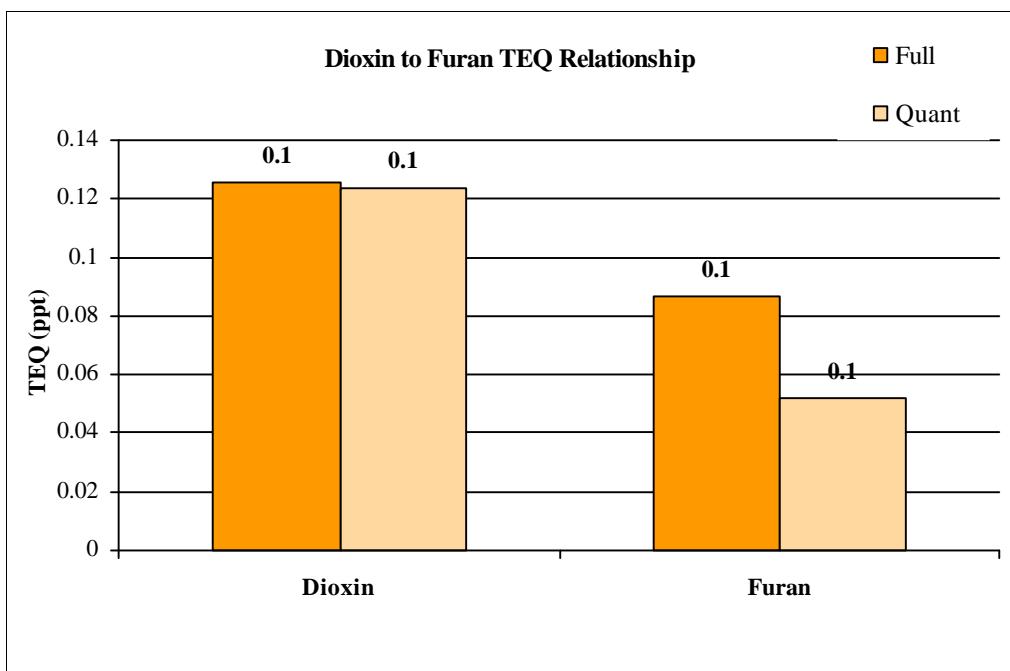
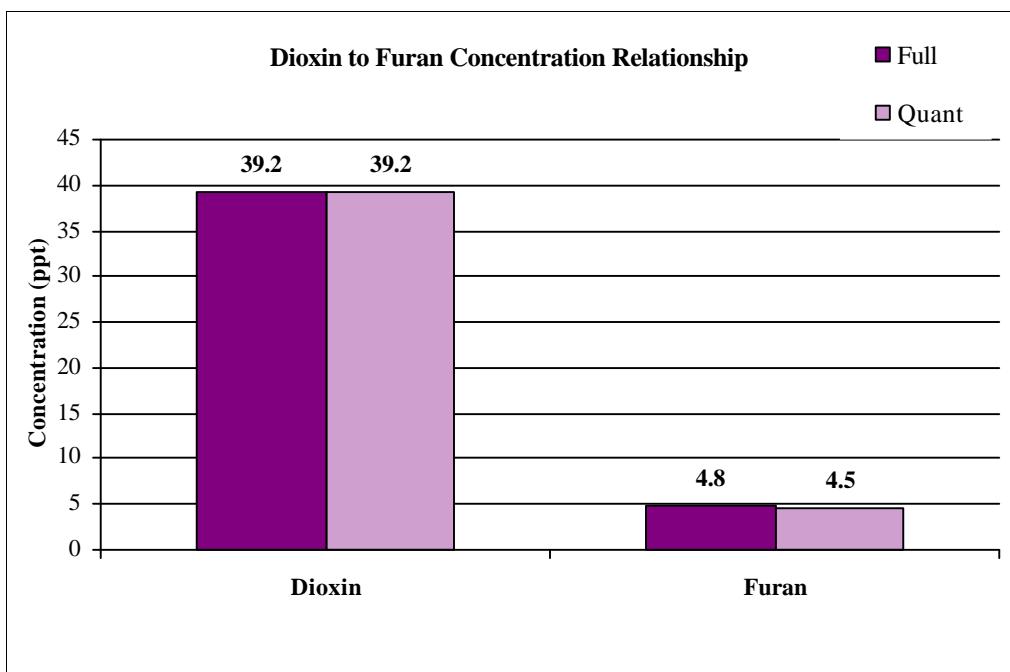
Sample 547

S26



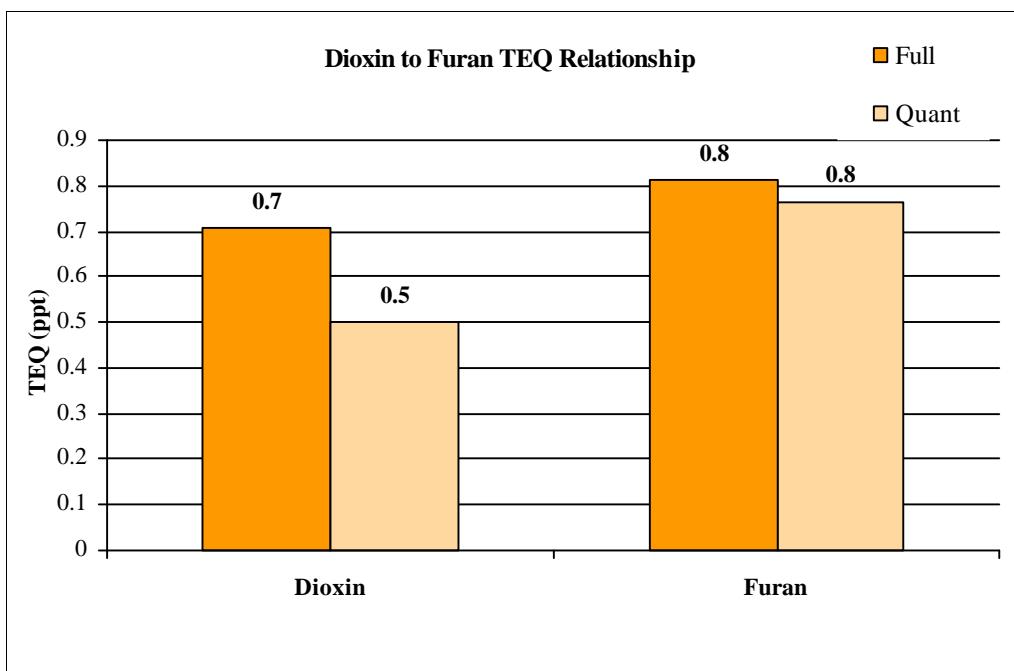
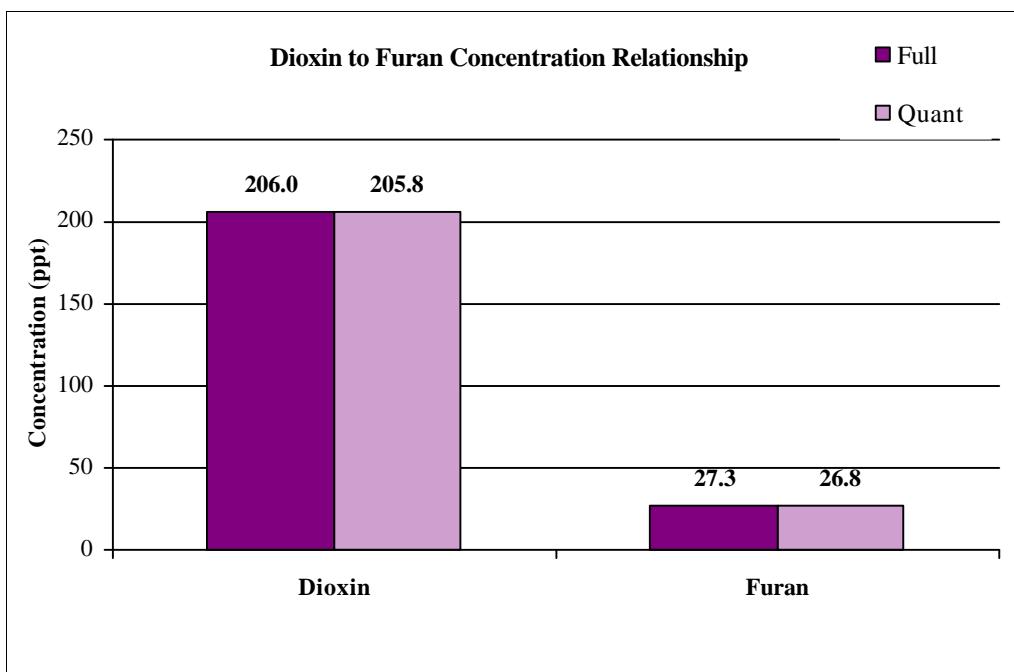
Sample 768

S27



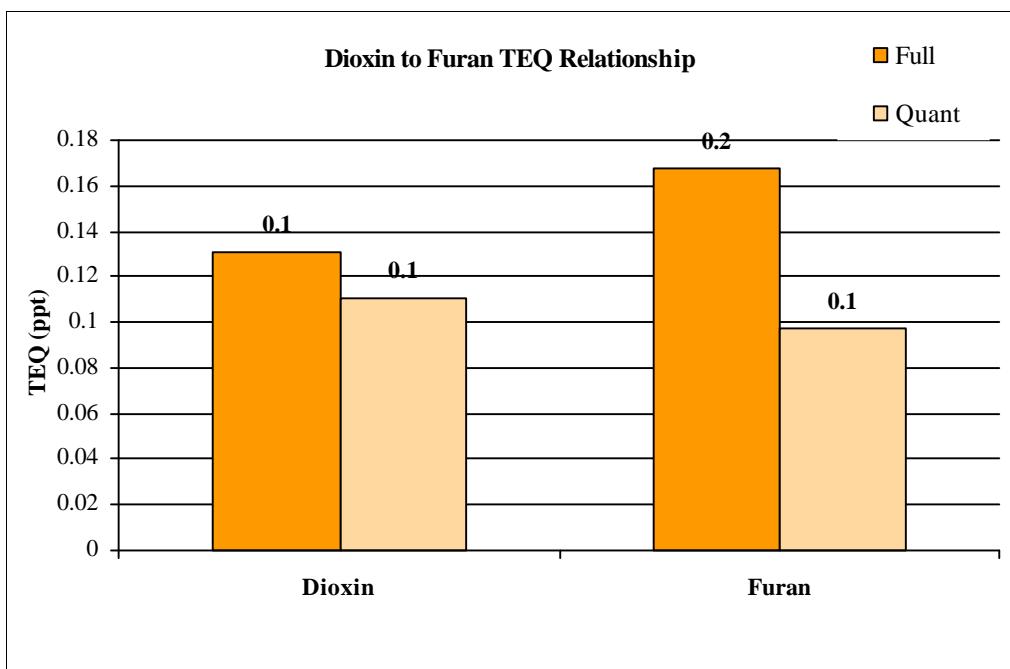
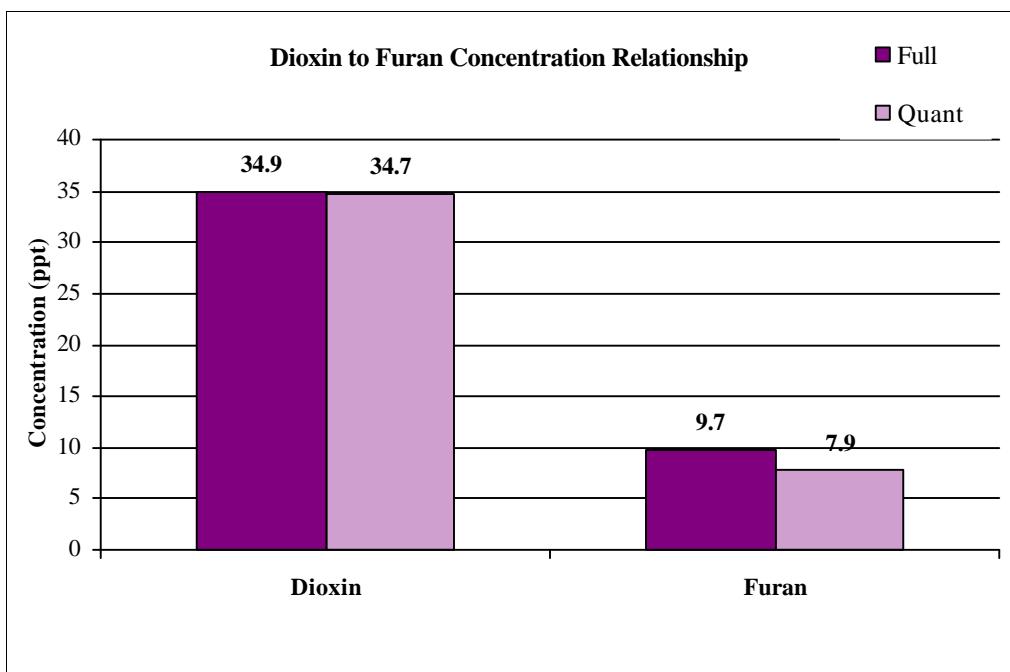
Sample 264

S28



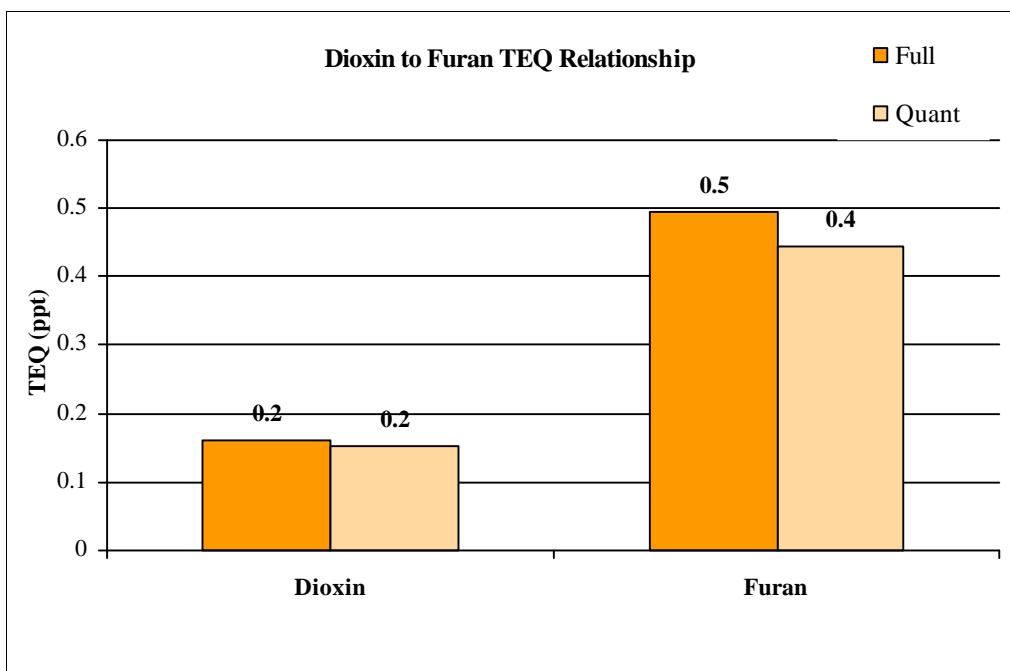
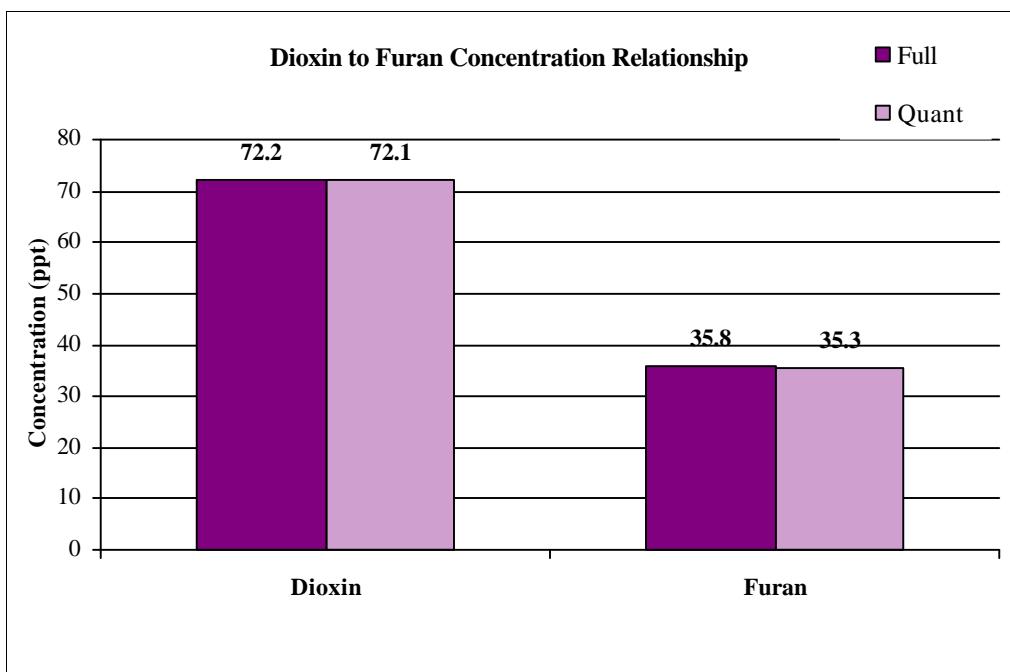
Sample 443

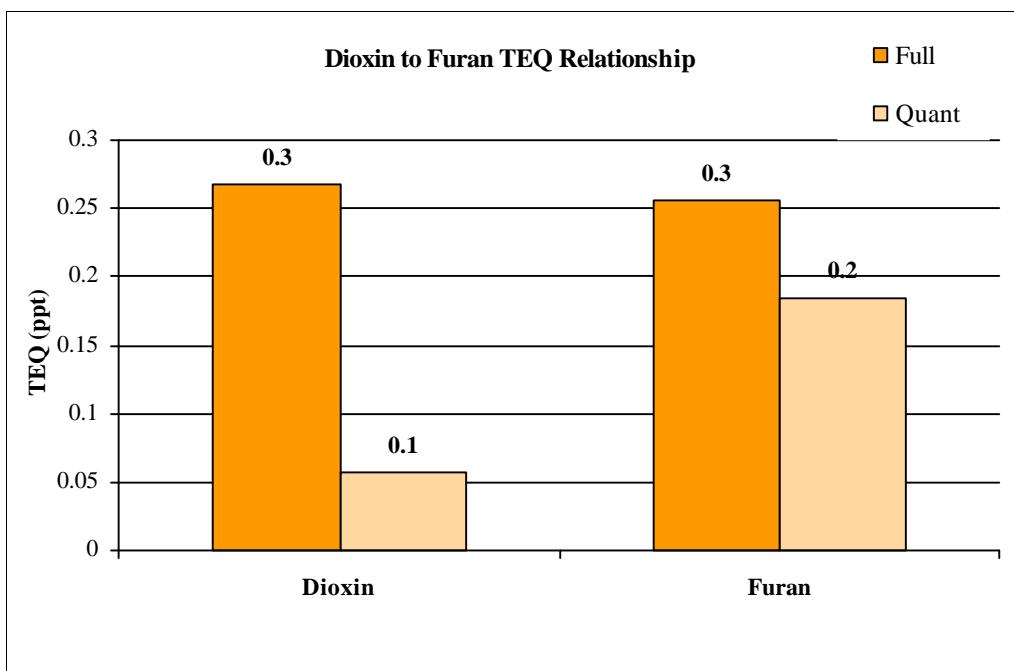
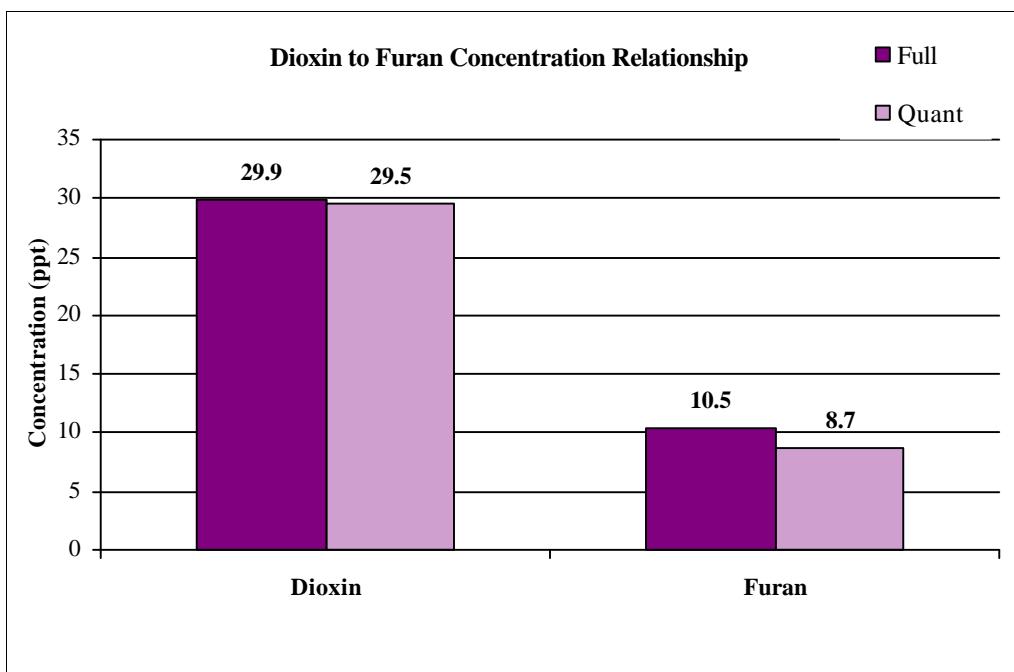
S29

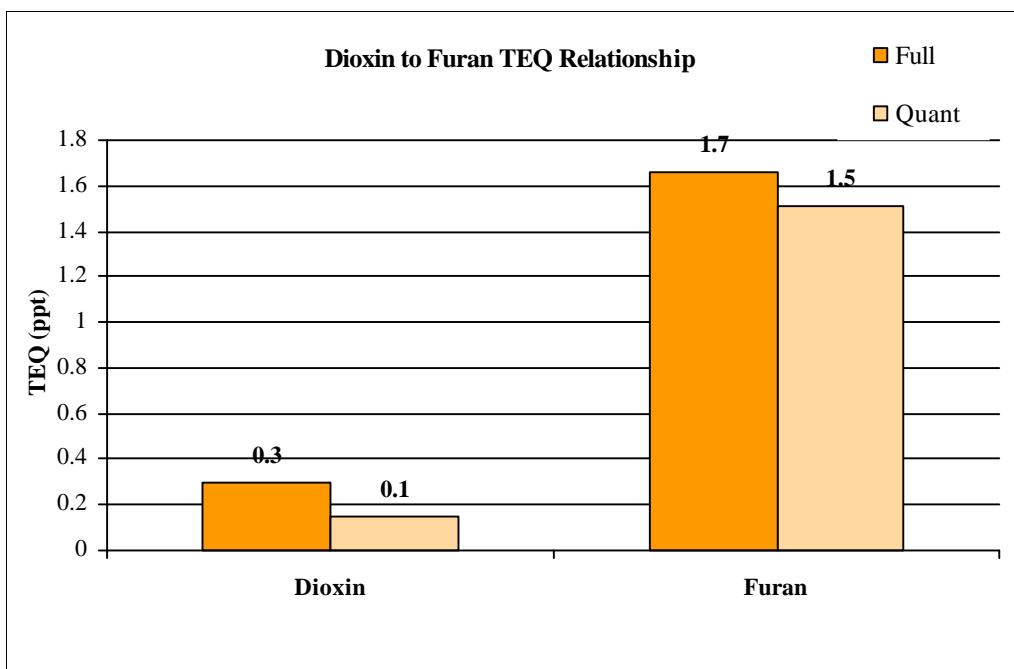
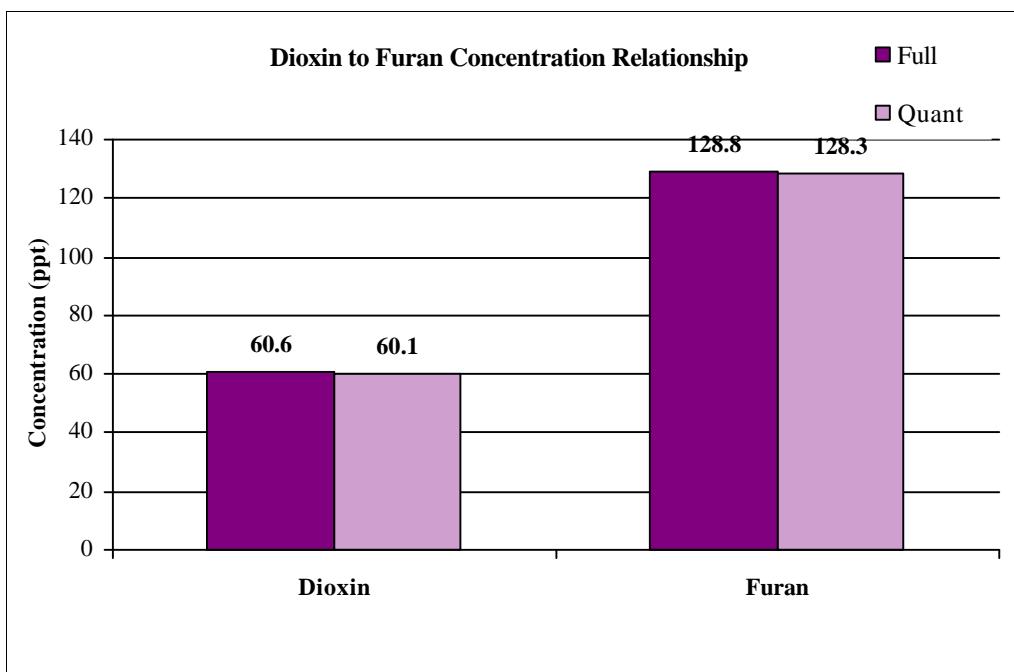


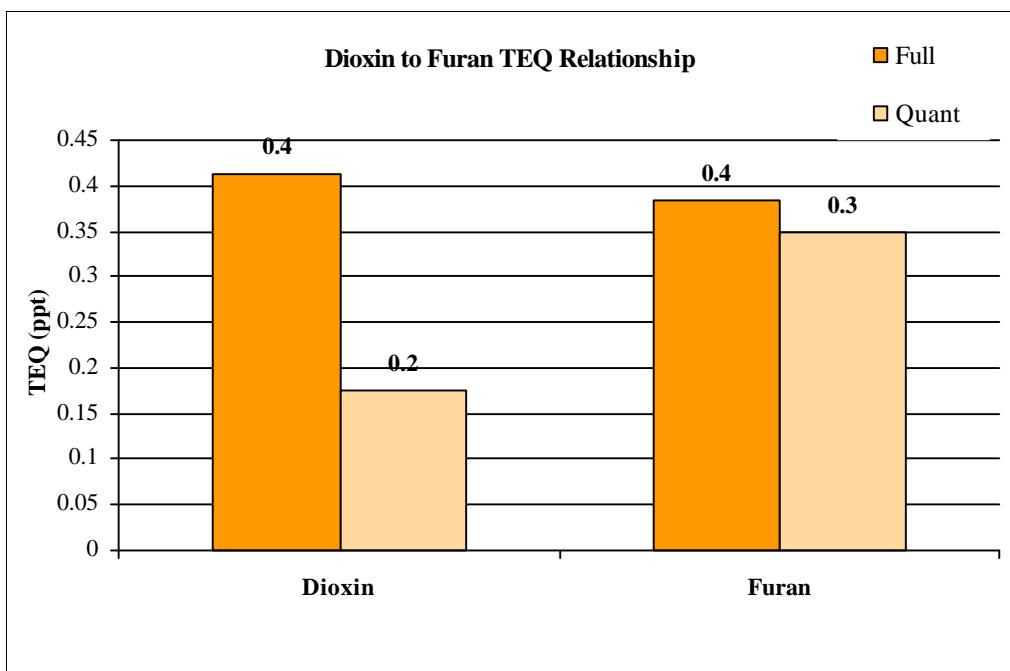
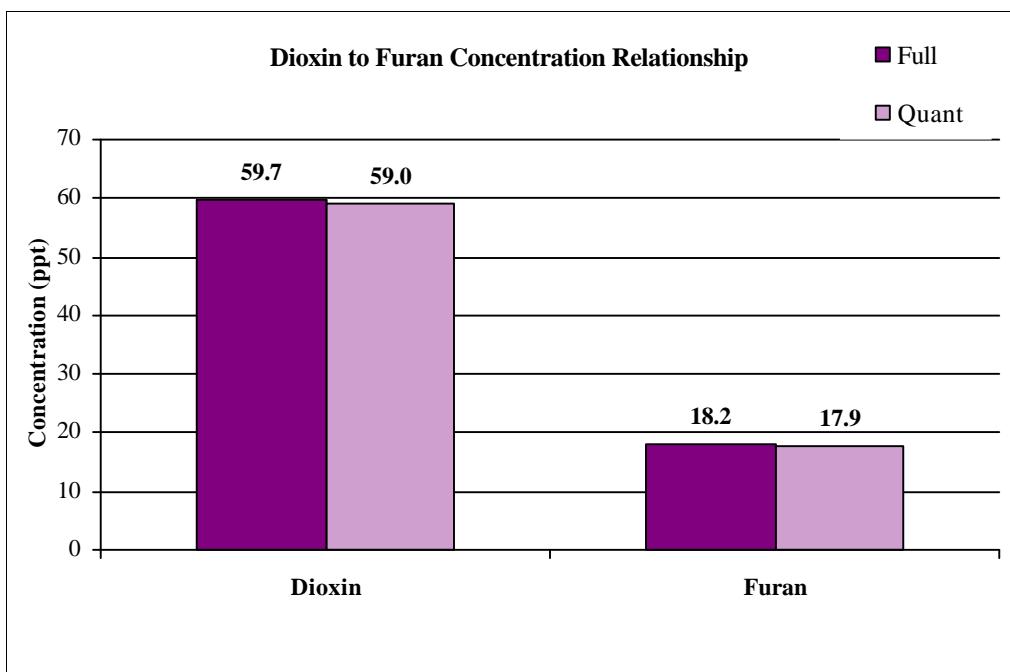
Sample 641

S3



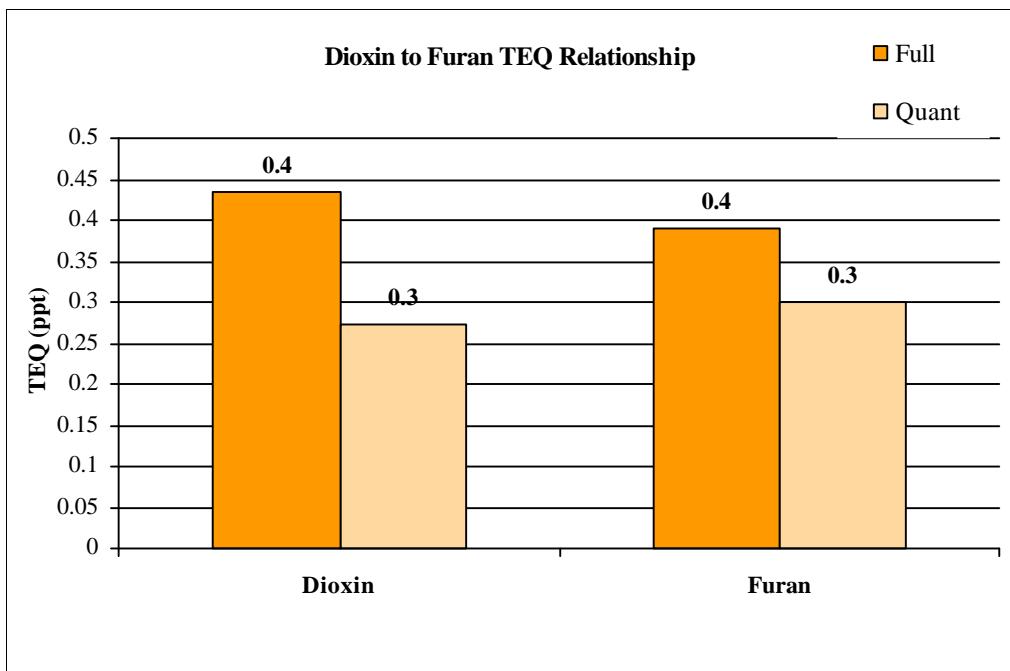
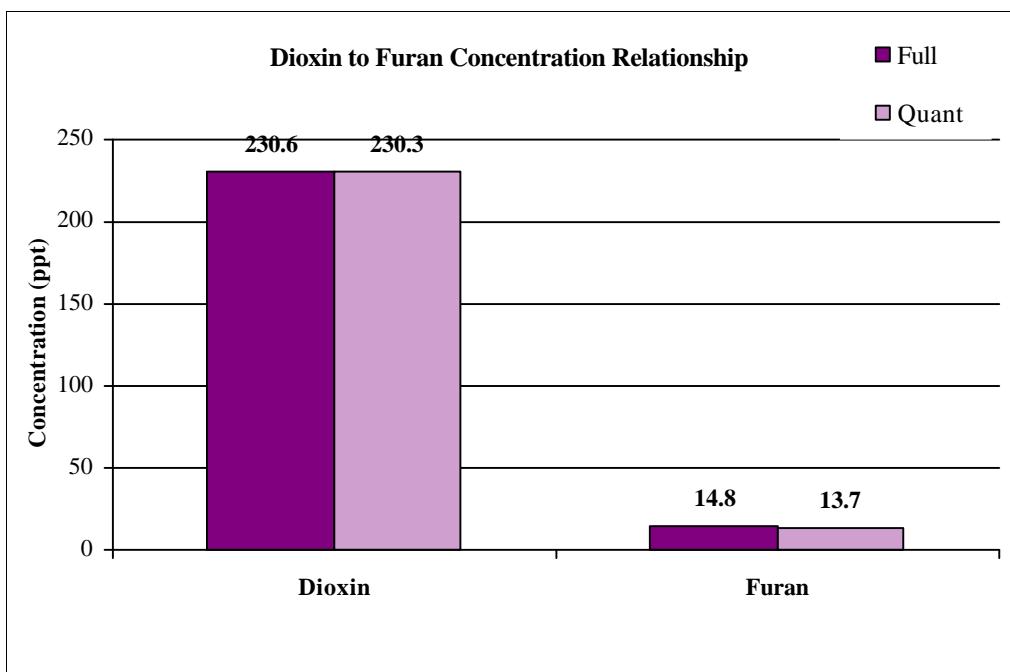
*Sample 736**S30*

*Sample 616**S31*

*Sample 945**S32*

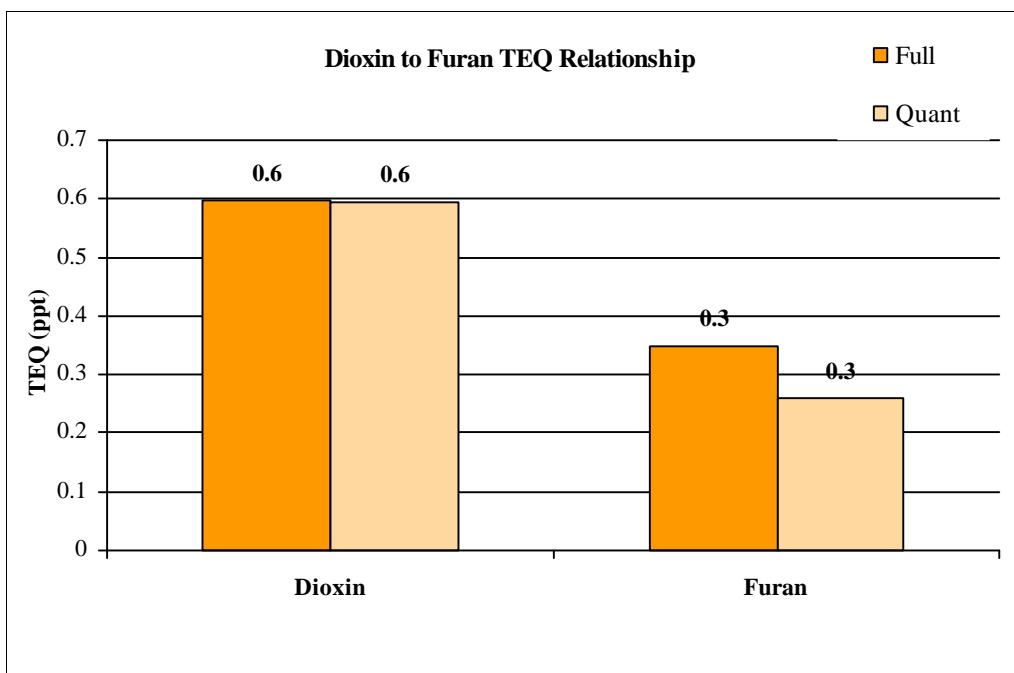
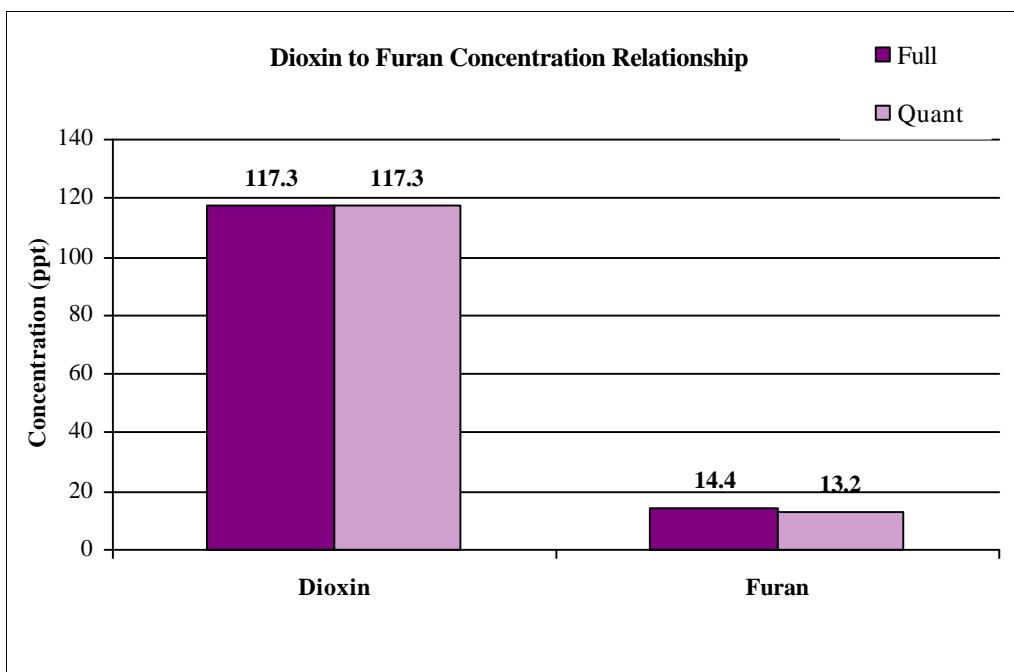
Sample 564

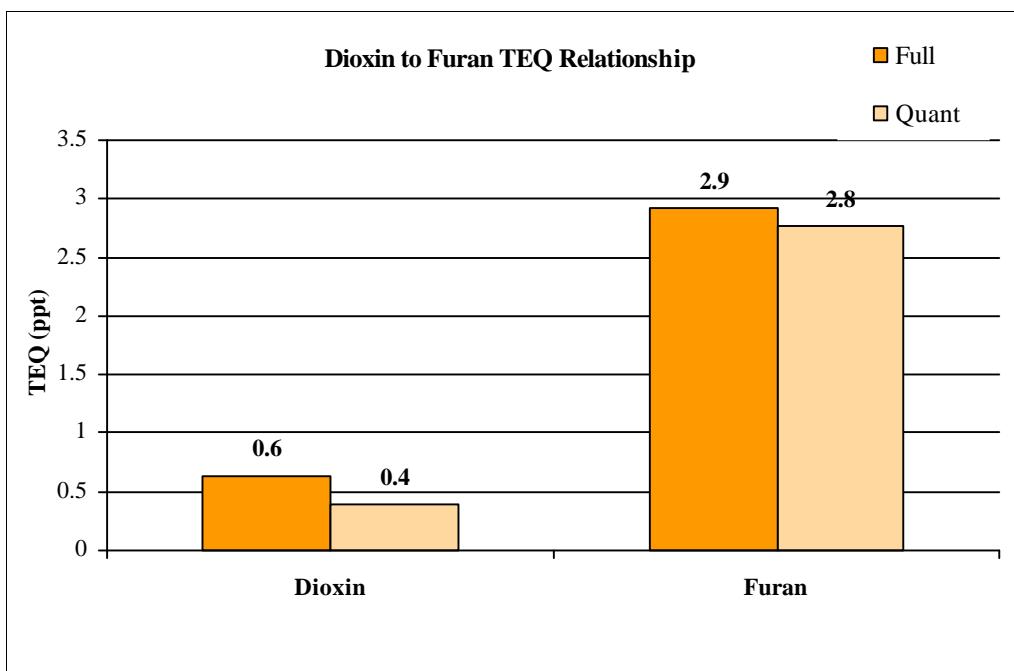
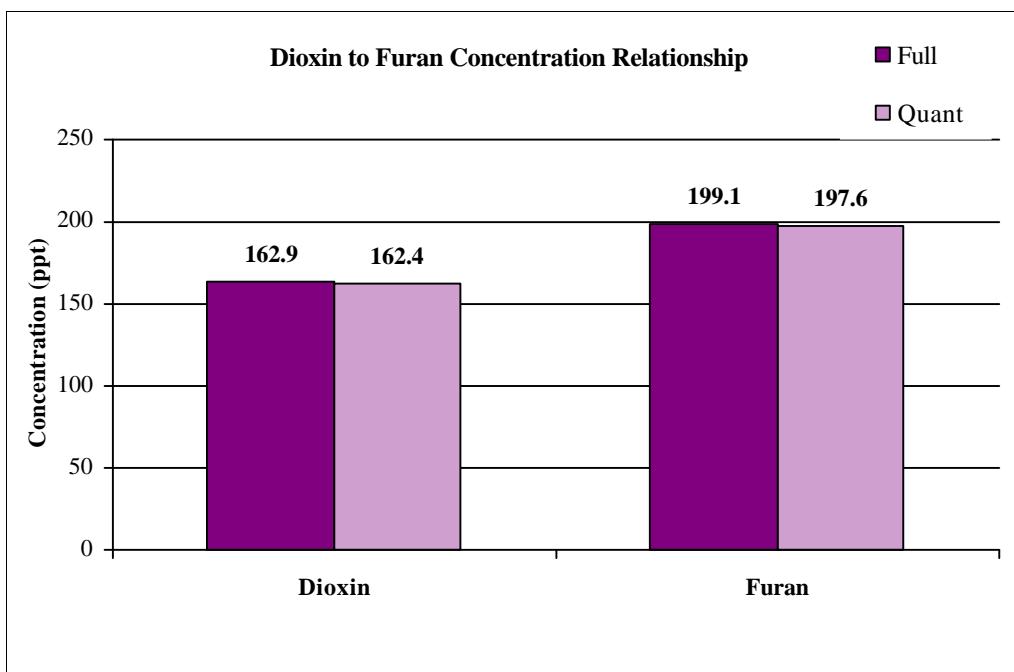
S33

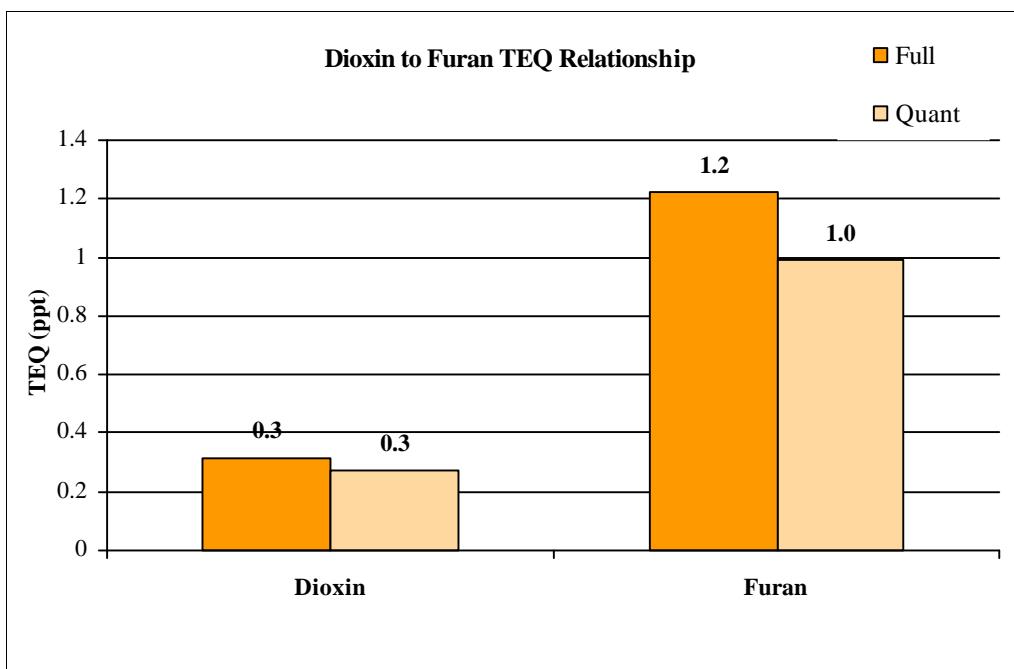
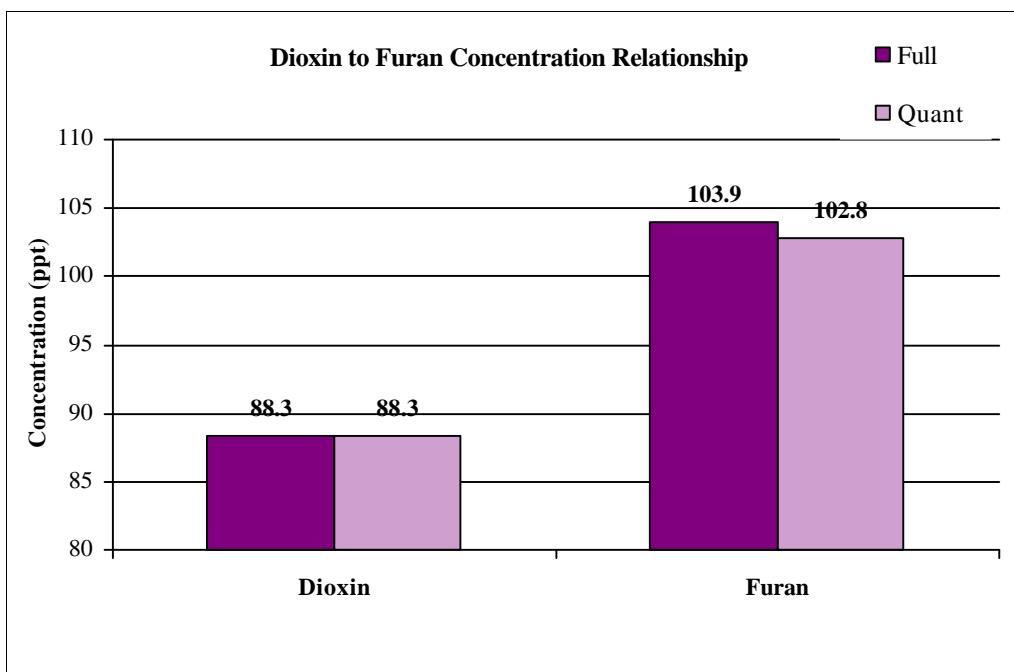


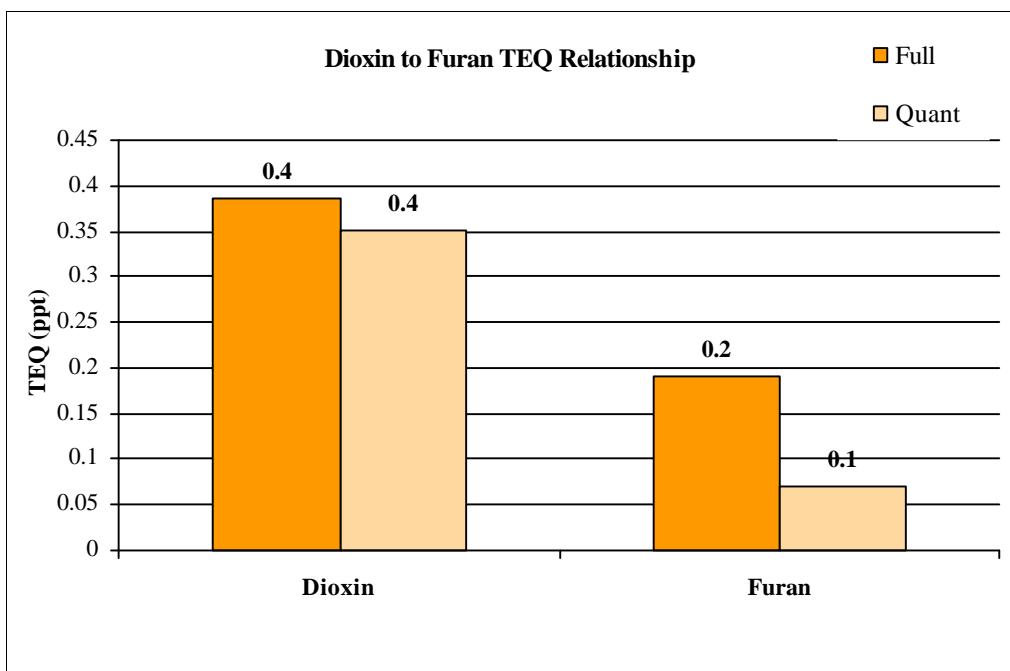
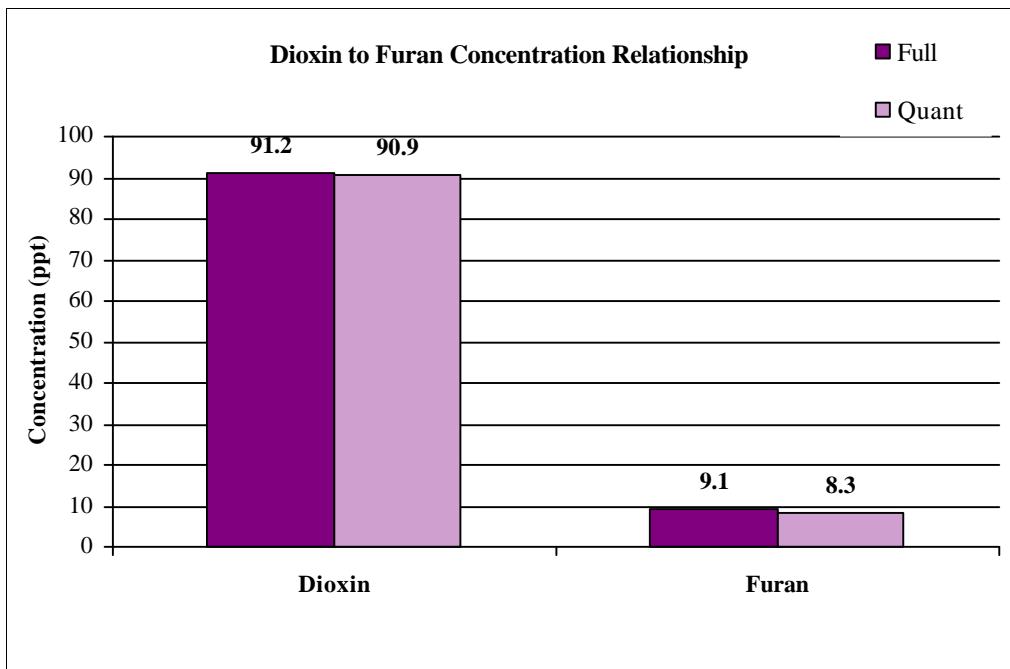
Sample 693

S34



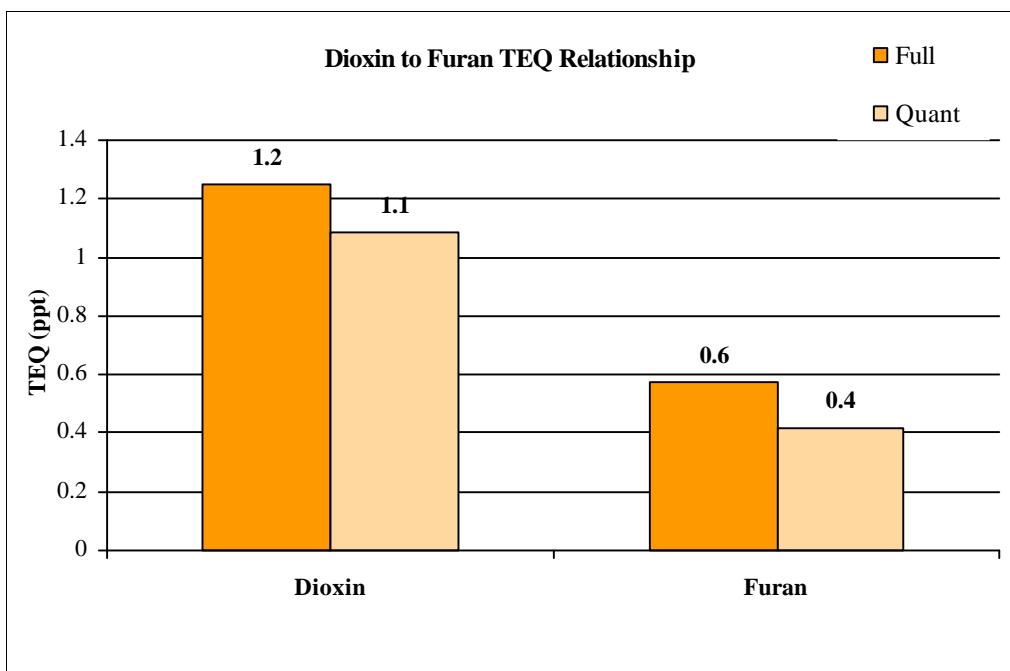
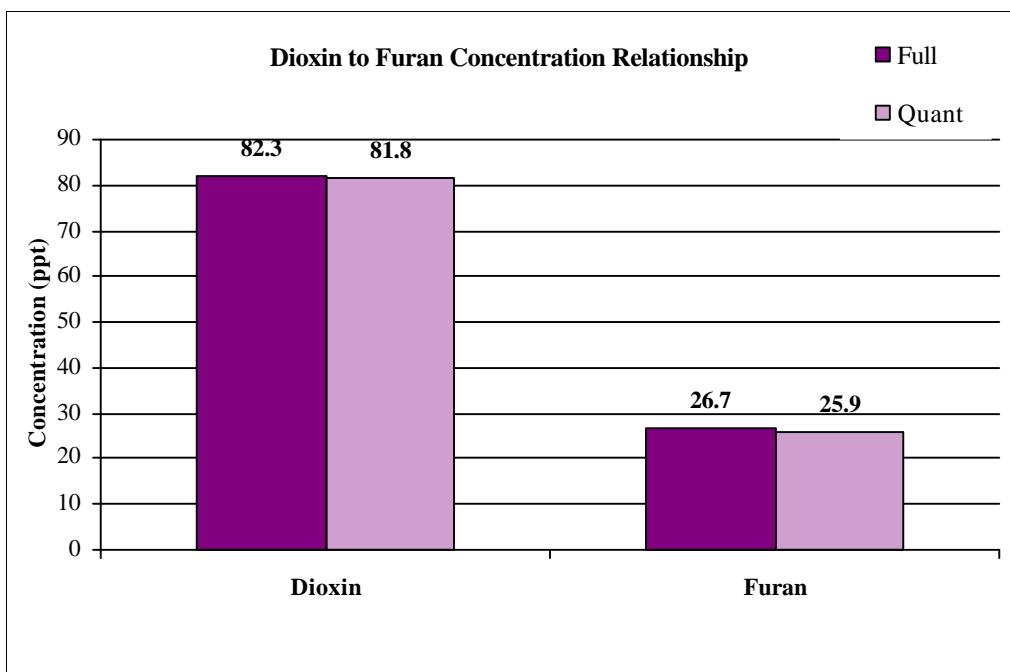
*Sample 389**S35*

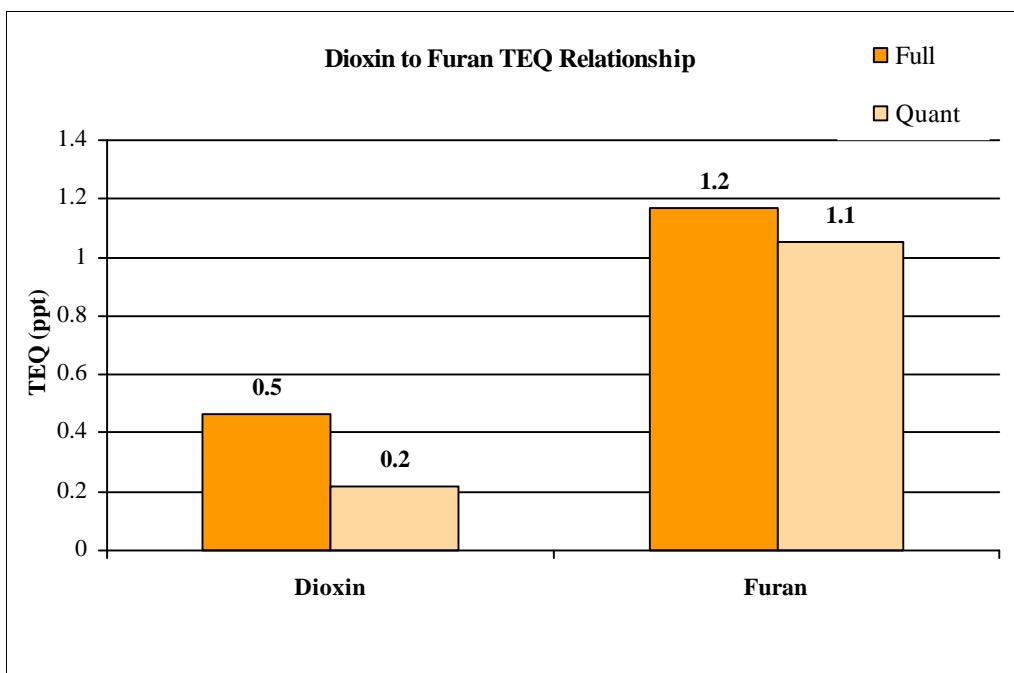
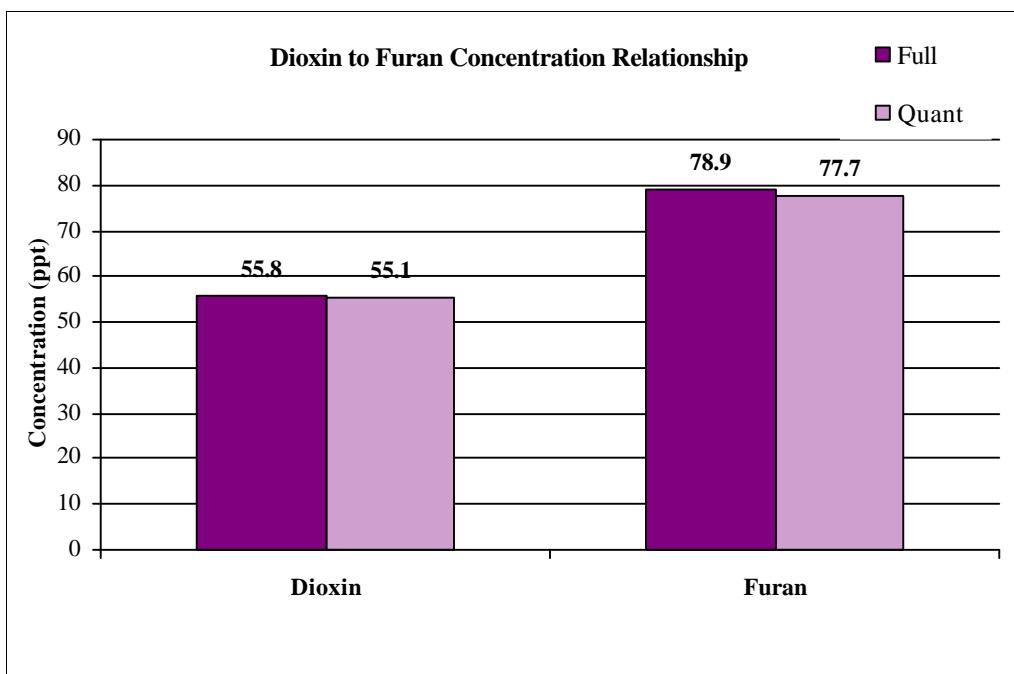
*Sample 991**S36*

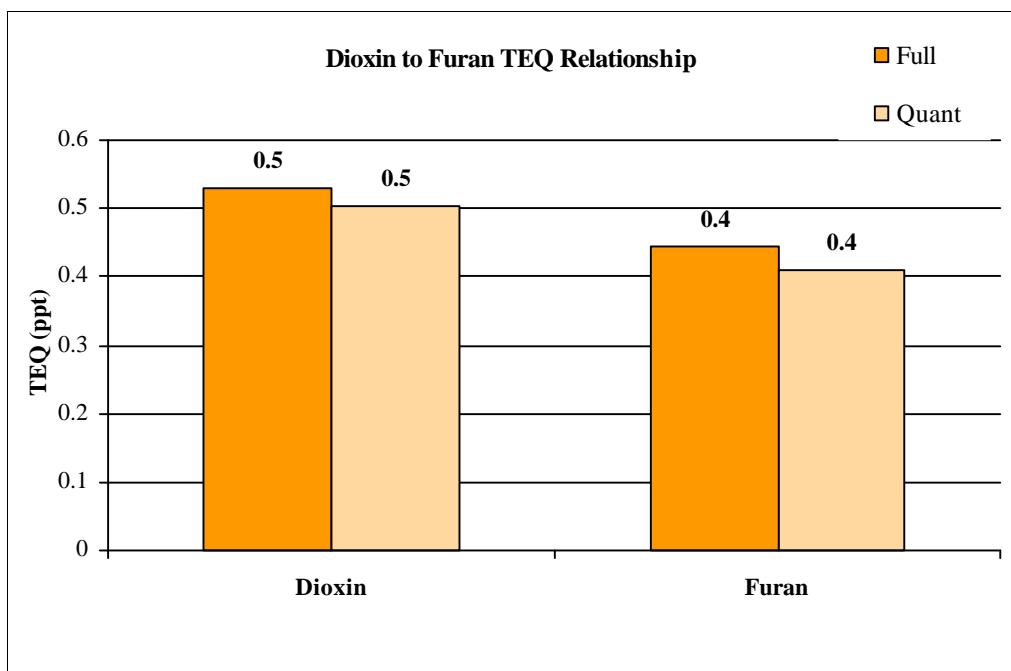
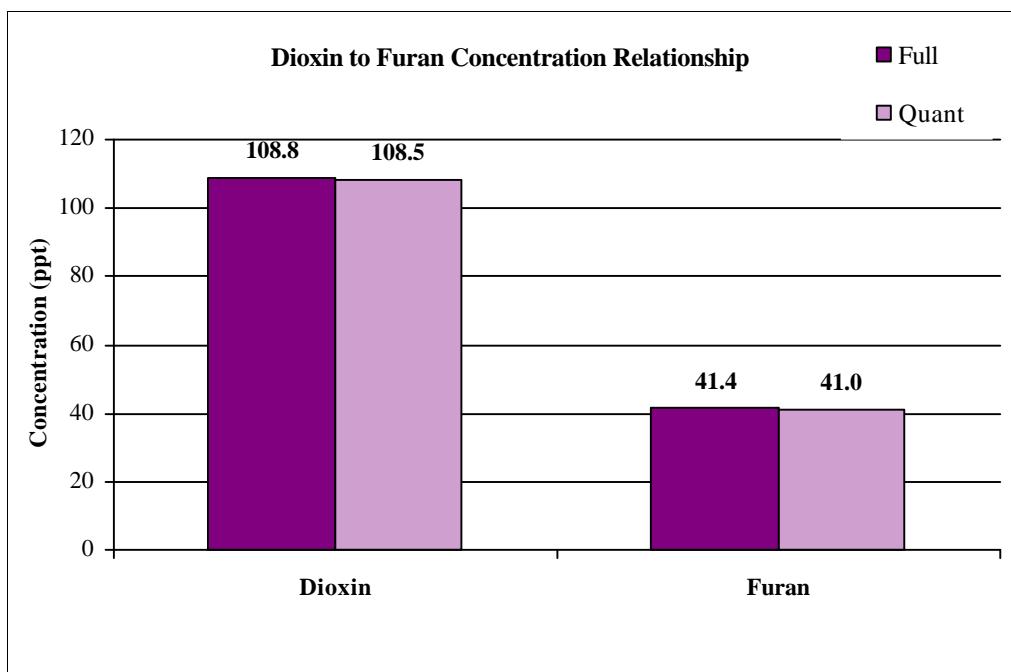
*Sample 102**S4*

Sample 234

S5

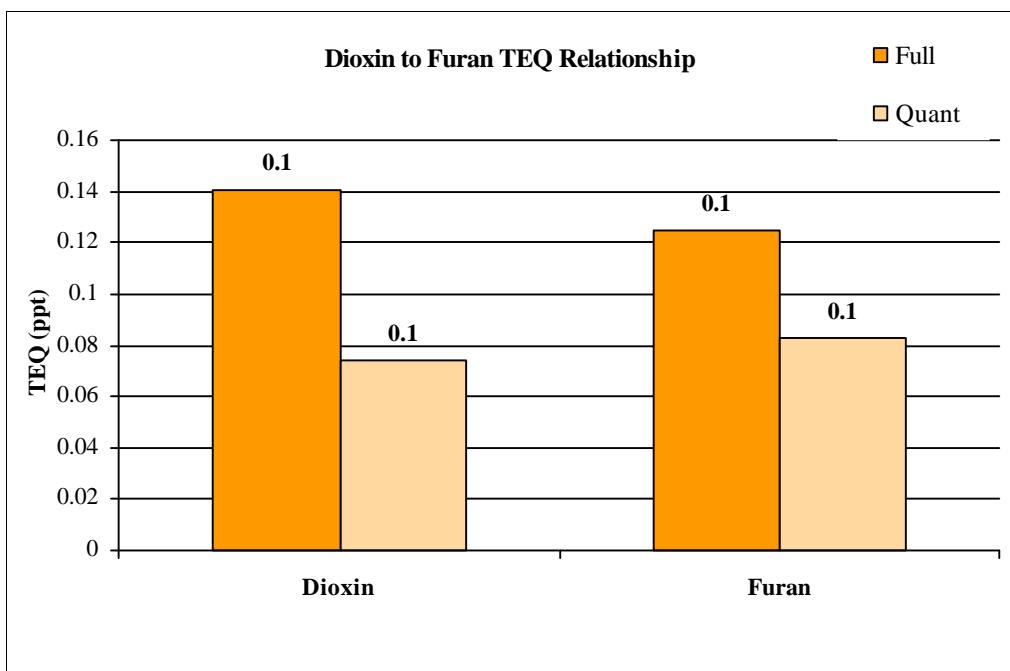
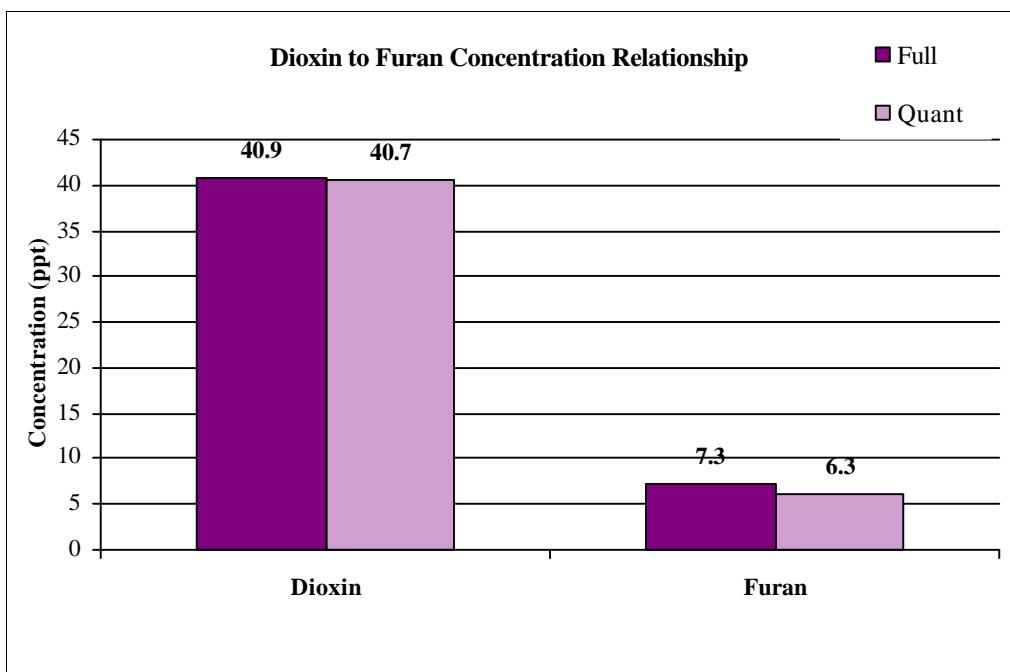


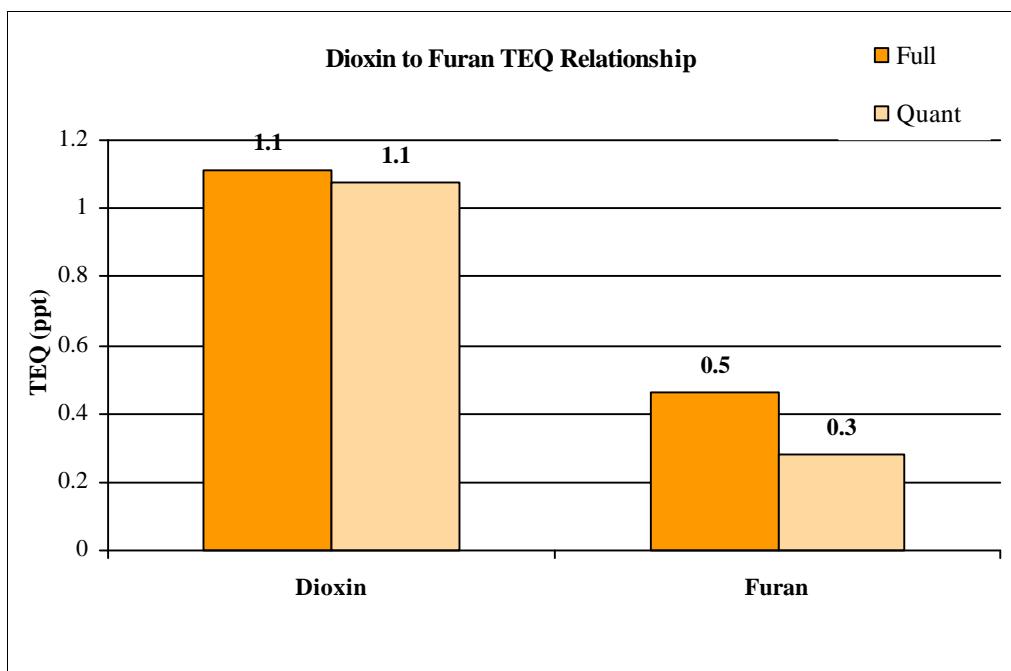
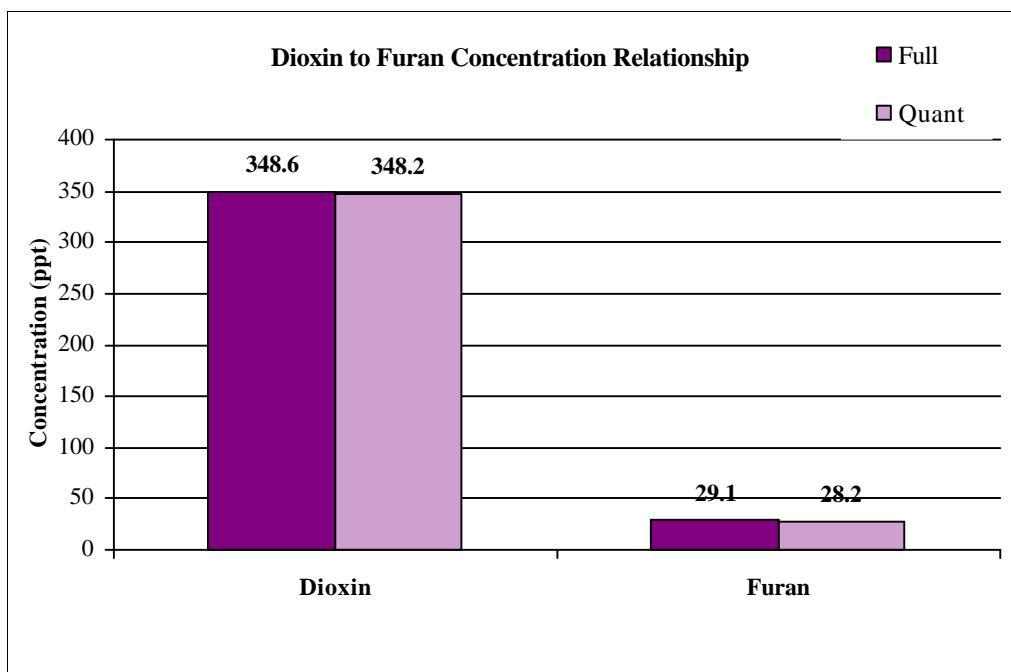
*Sample 830**S6*

*Sample 788**S7*

Sample 589

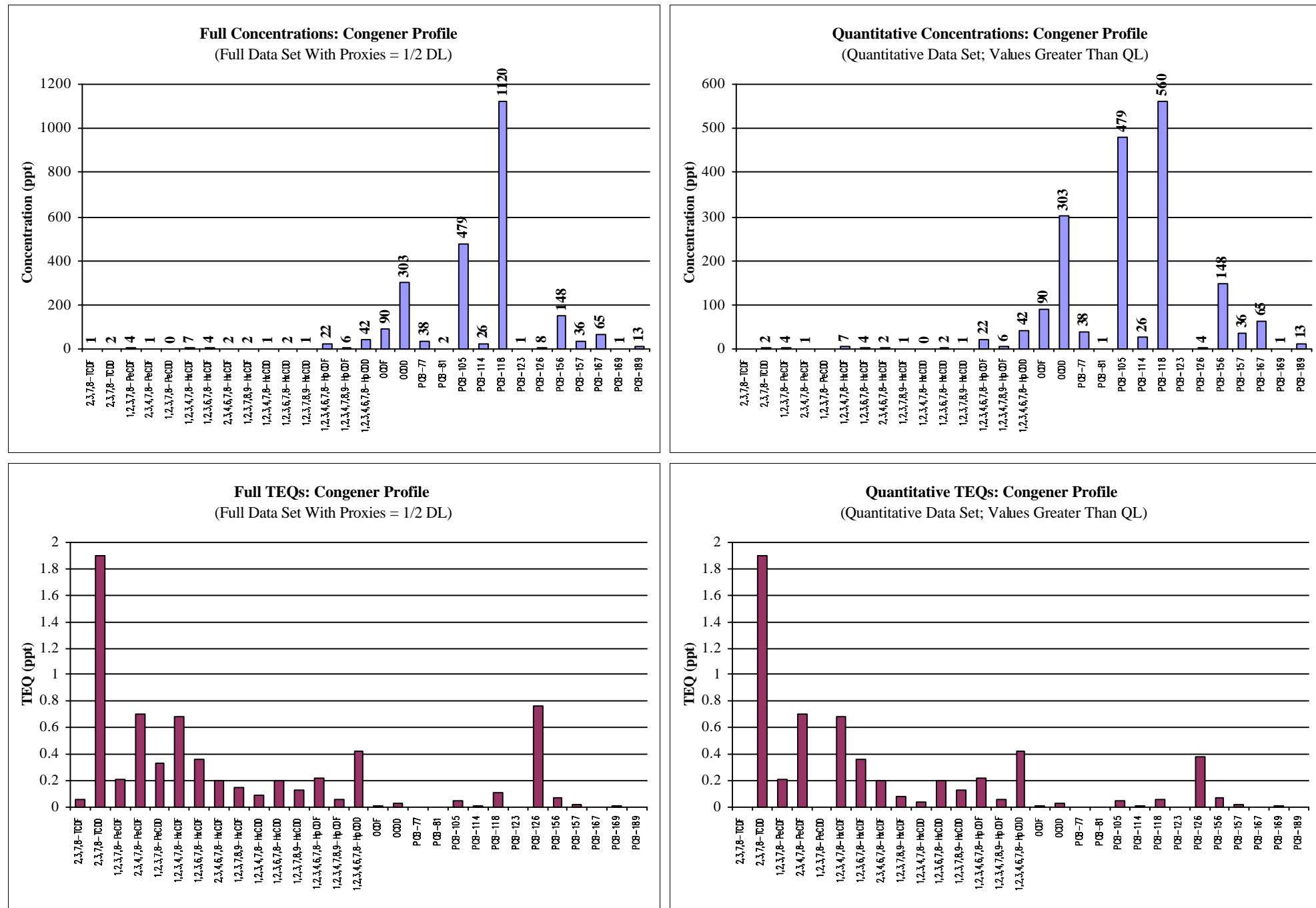
S8



*Sample 249**S9*

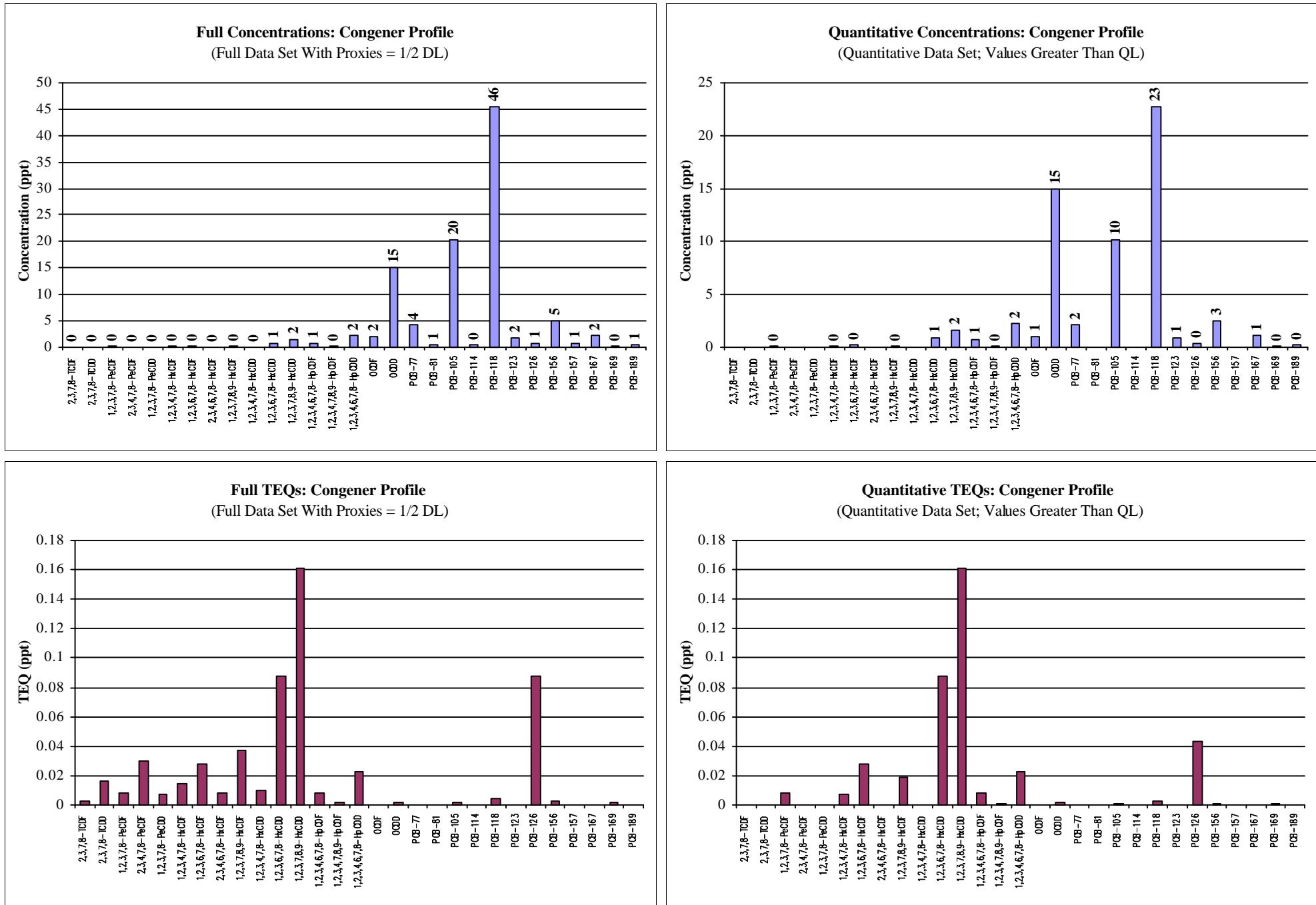
Appendix B4. Congener Profiles for QC Samples

Sample **429-B** *S2* *Bulk*



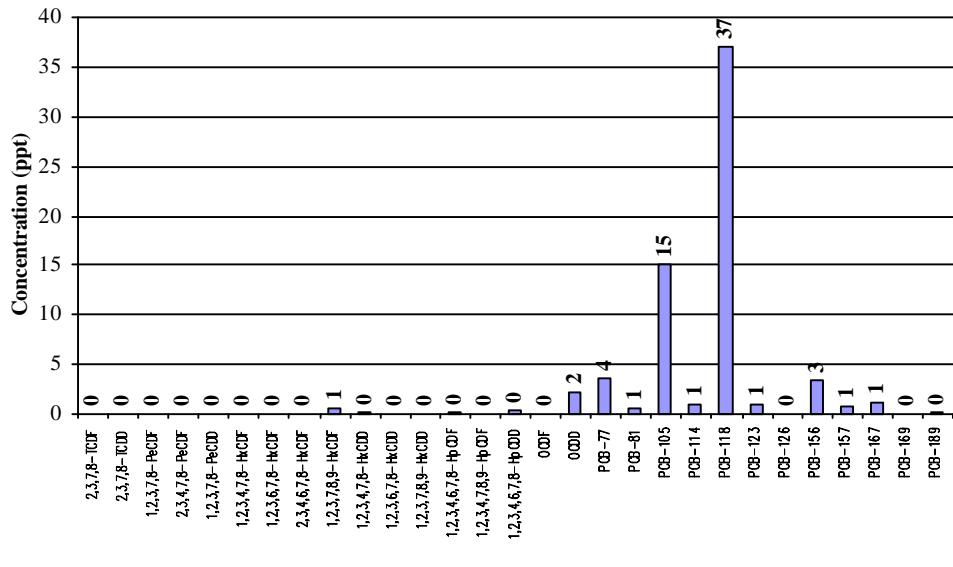
Appendix B4. Congener Profiles for QC Samples

Sample 338 S23 *Duplicate*

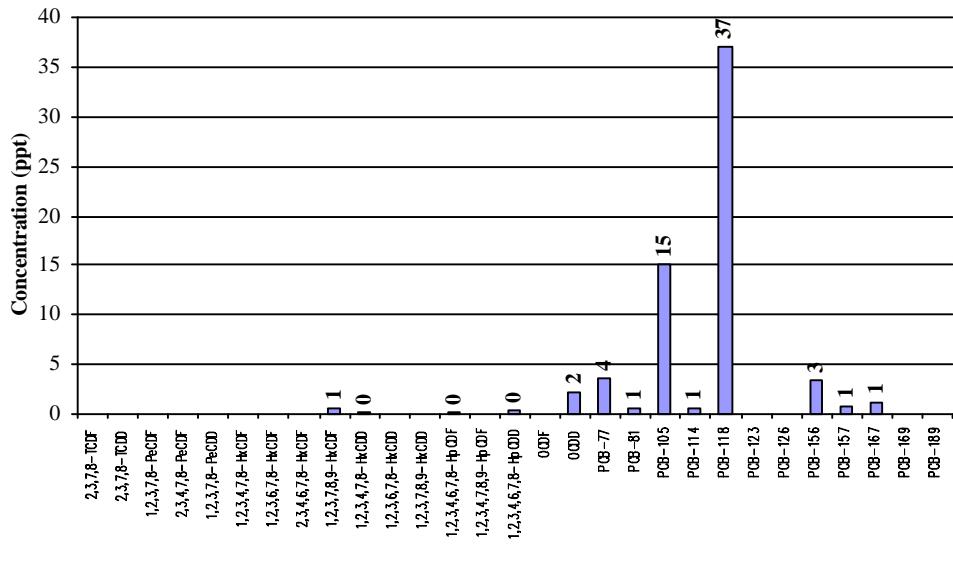


Appendix B4. Congener Profiles for QC Samples*Sample GAAWMB**Lab Blank***Full Concentrations: Congener Profile**

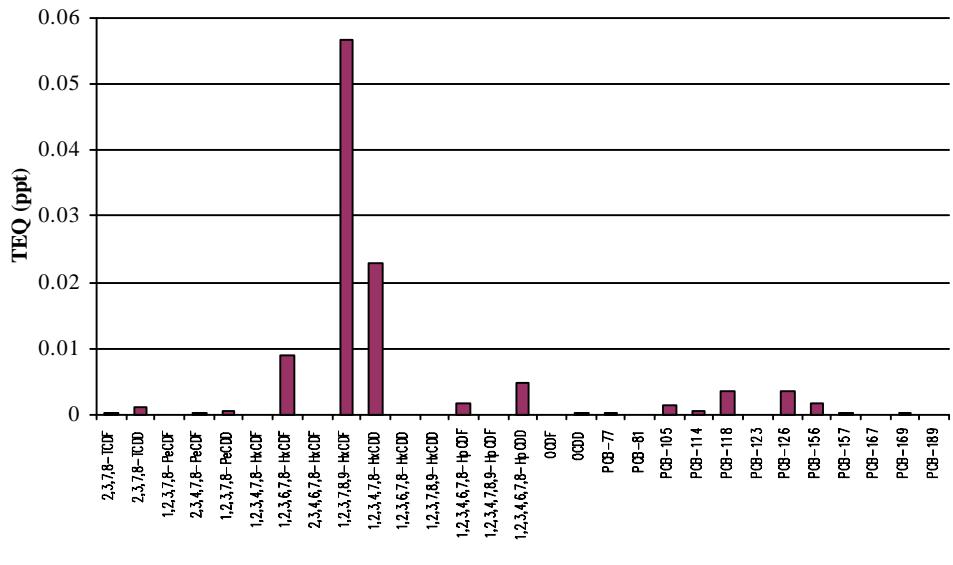
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

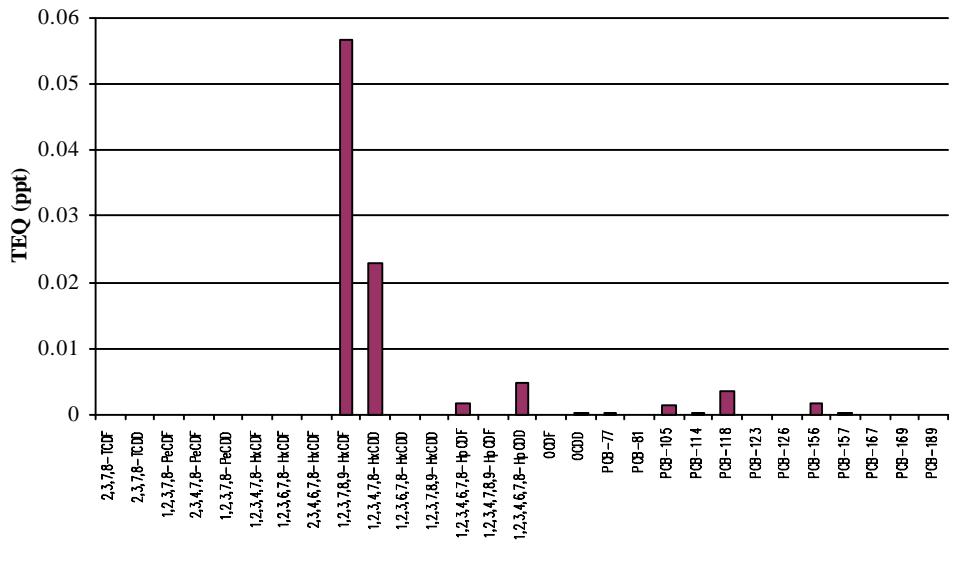
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

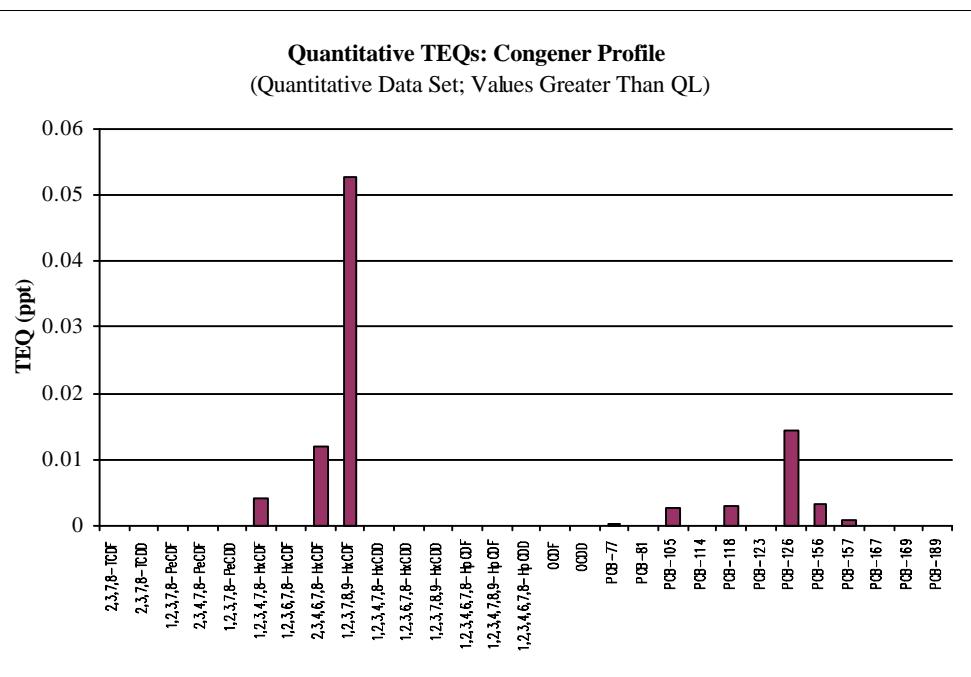
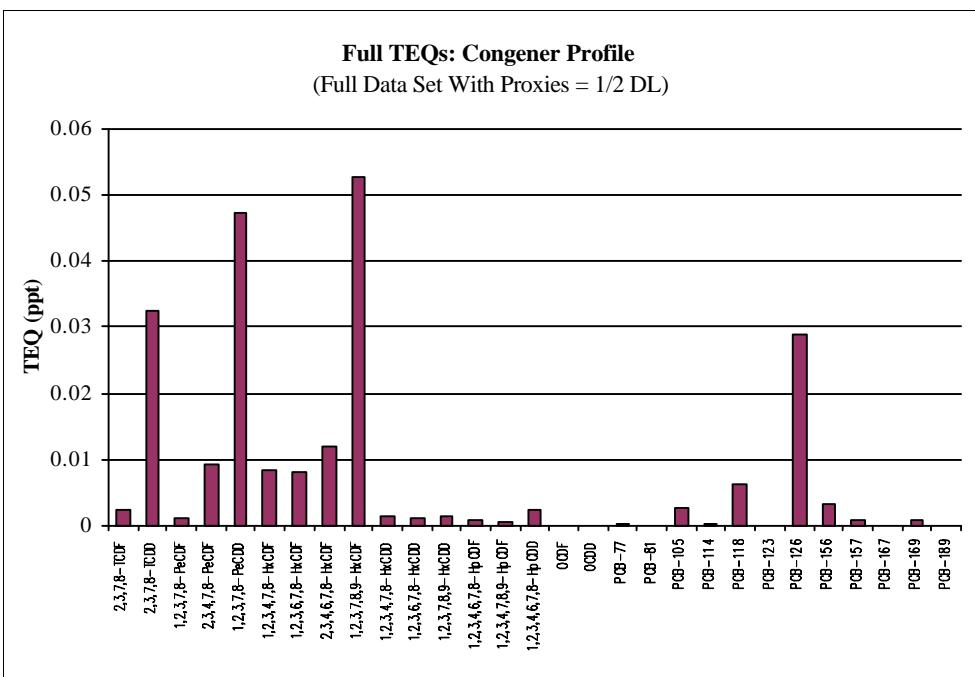
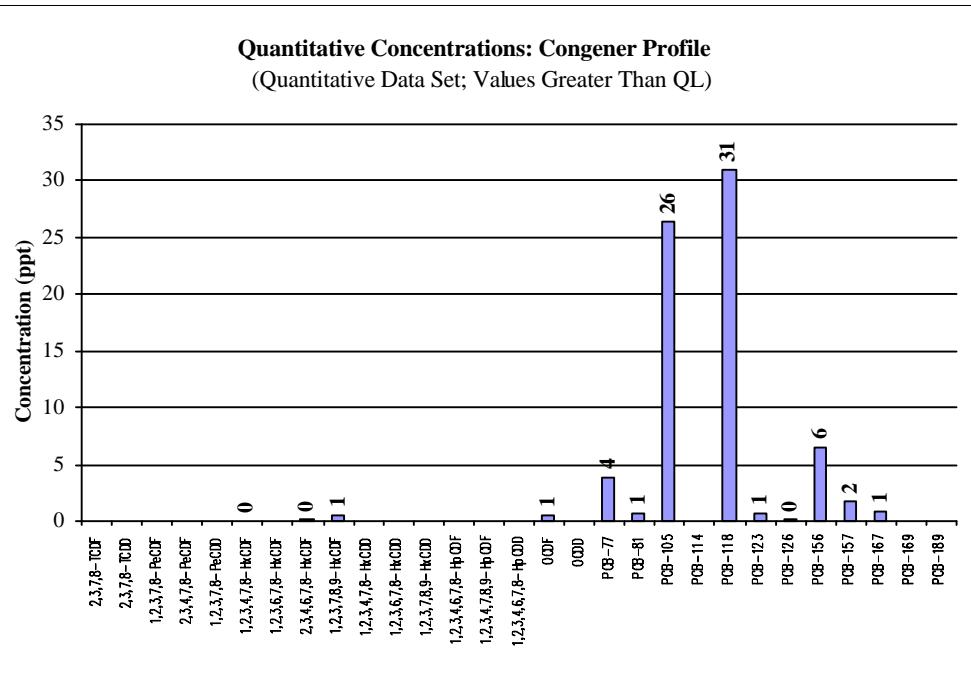
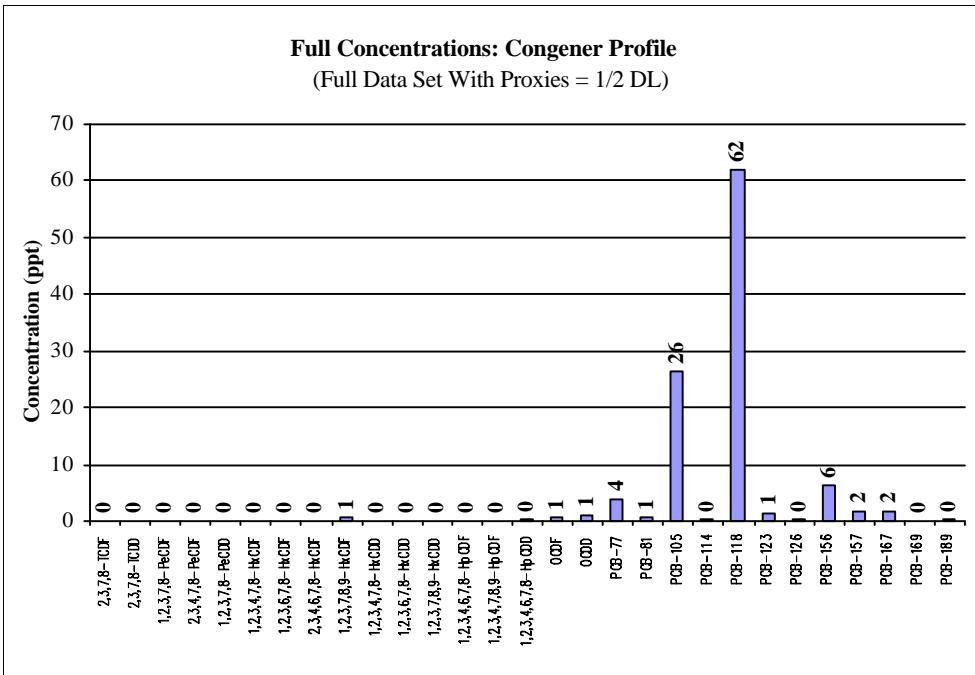
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)



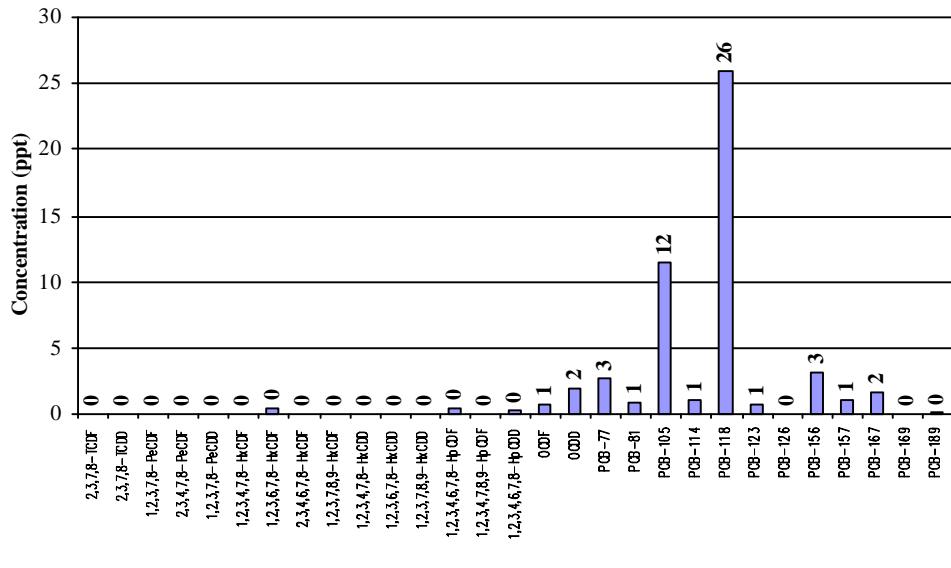
Appendix B4. Congener Profiles for QC Samples

FINAL

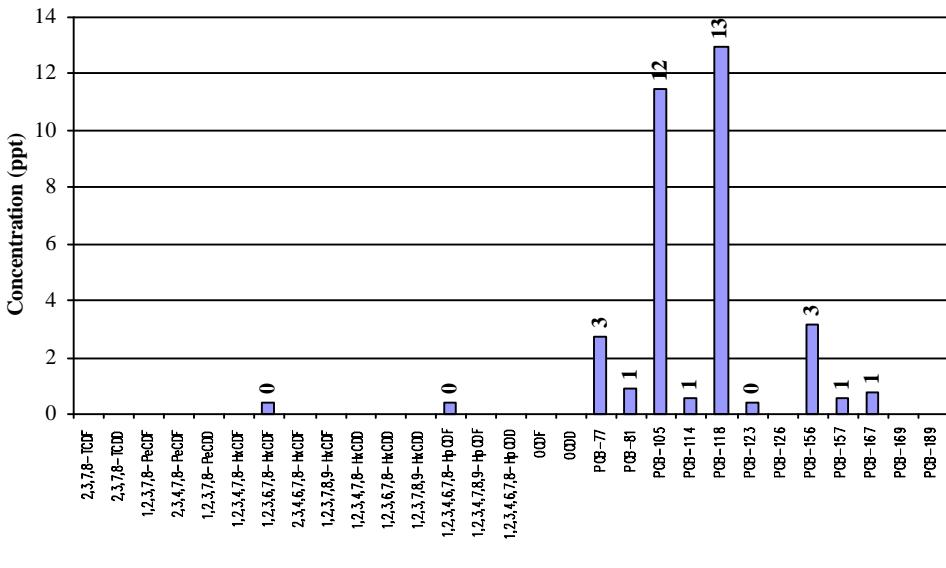
*Sample GAAXMB**Lab Blank*

Appendix B4. Congener Profiles for QC Samples**Sample GAAYMB****Lab Blank****Full Concentrations: Congener Profile**

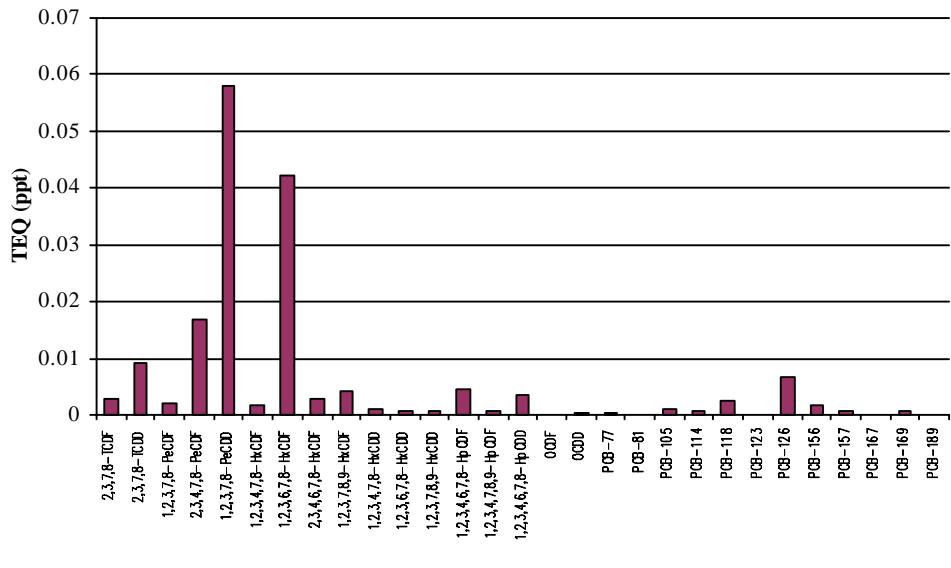
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

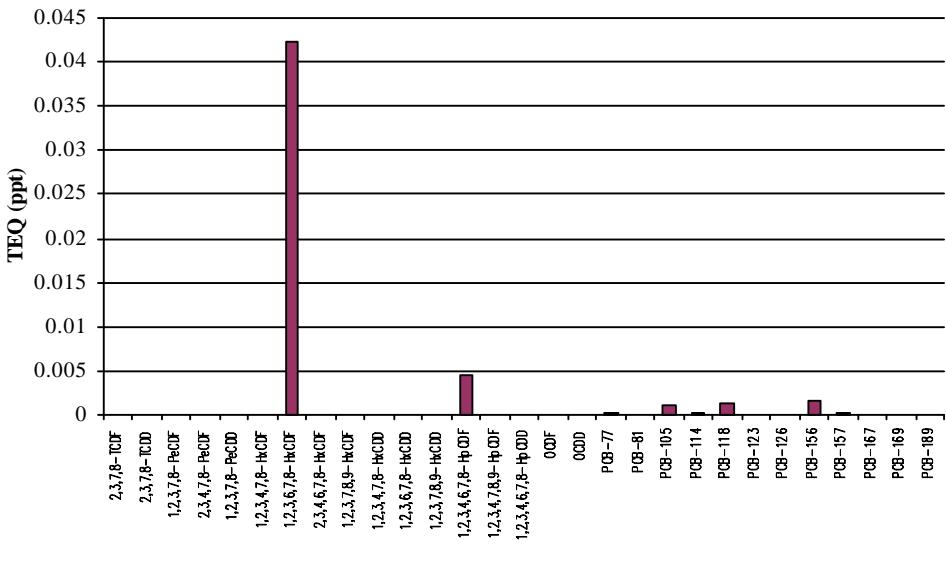
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

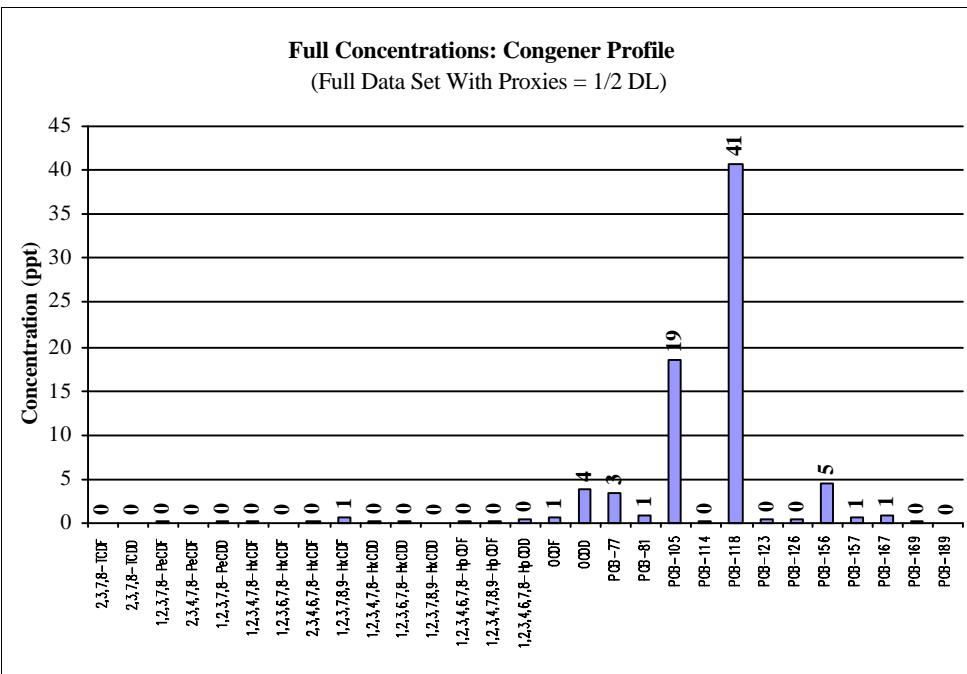
(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

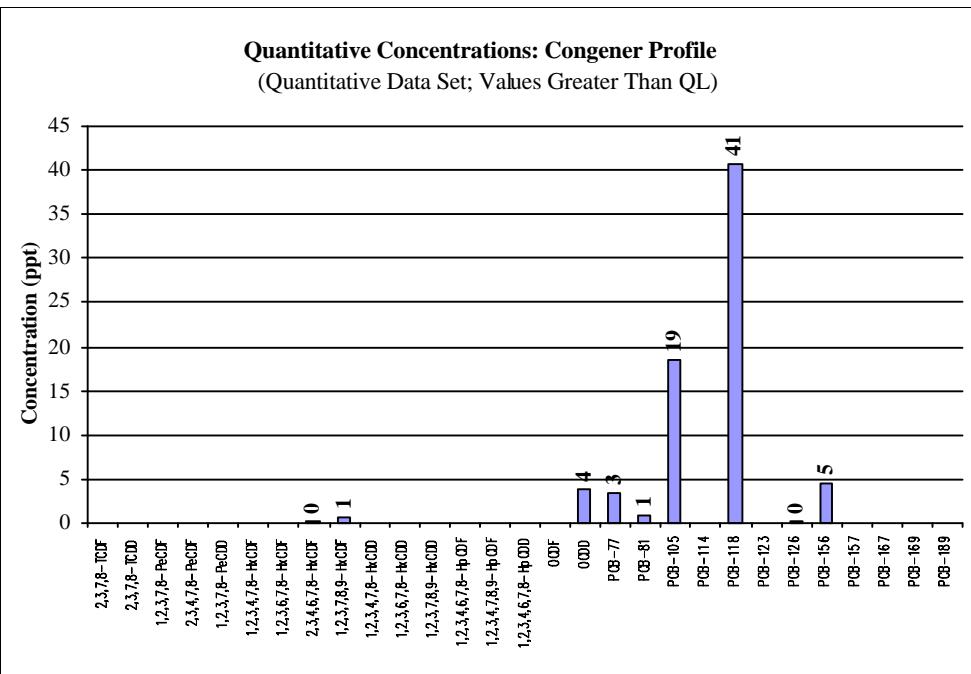
(Quantitative Data Set; Values Greater Than QL)



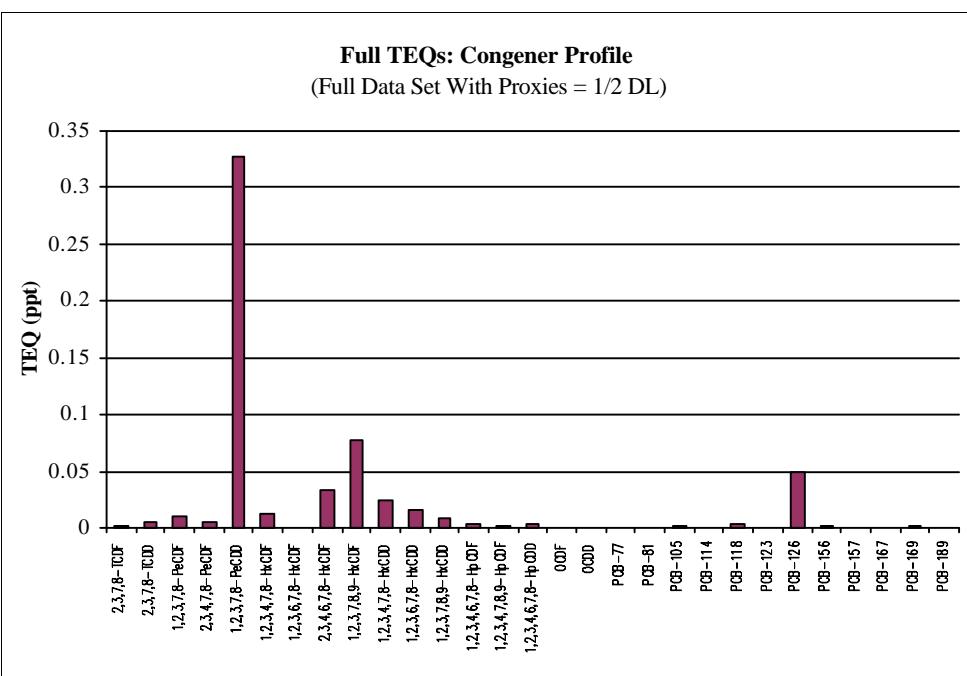
Sample GBAEMB



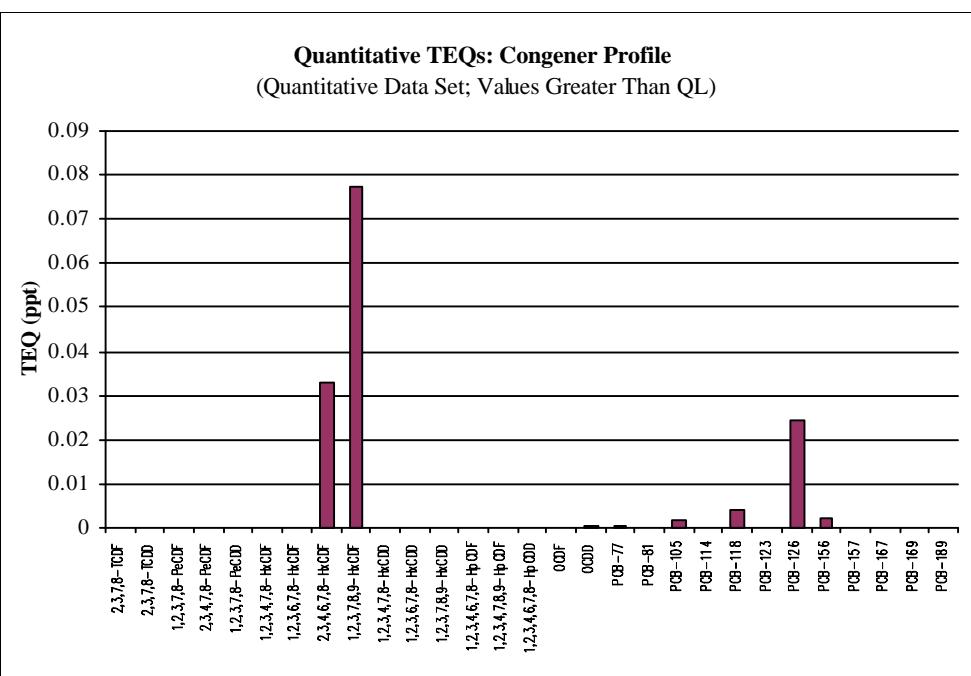
Lab Blank



Full TEQs: Congener Profile

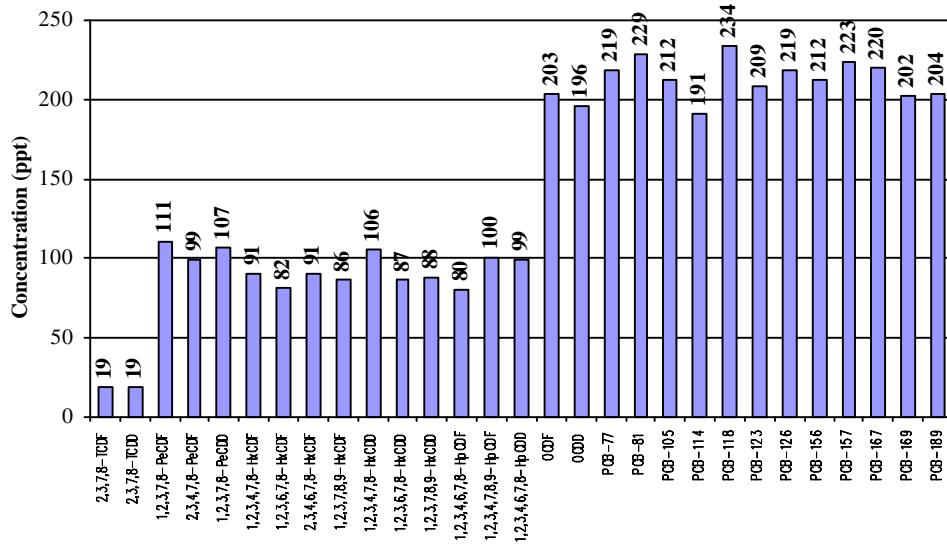


Quantitative TEQs: Congener Profile

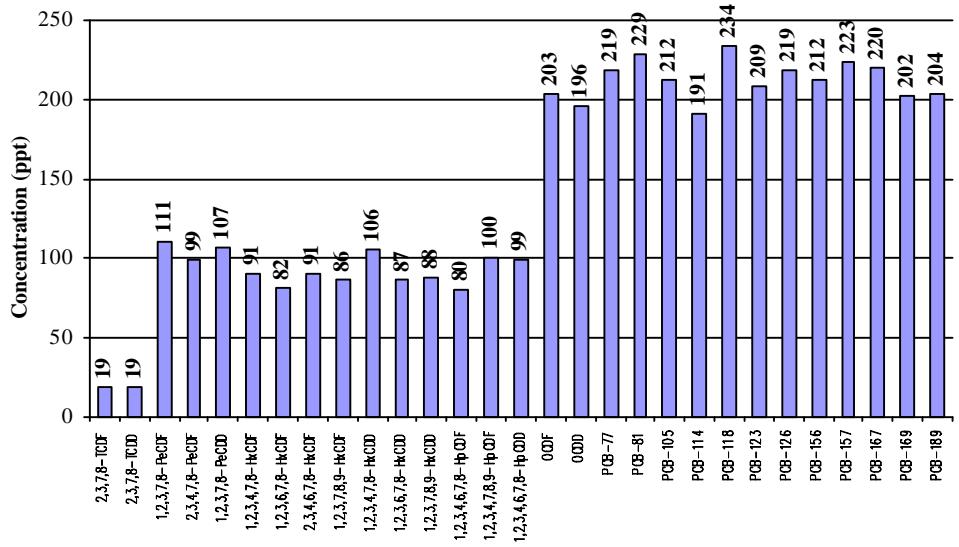


Appendix B4. Congener Profiles for QC Samples**Sample GAAWLCS****Lab Spike****Full Concentrations: Congener Profile**

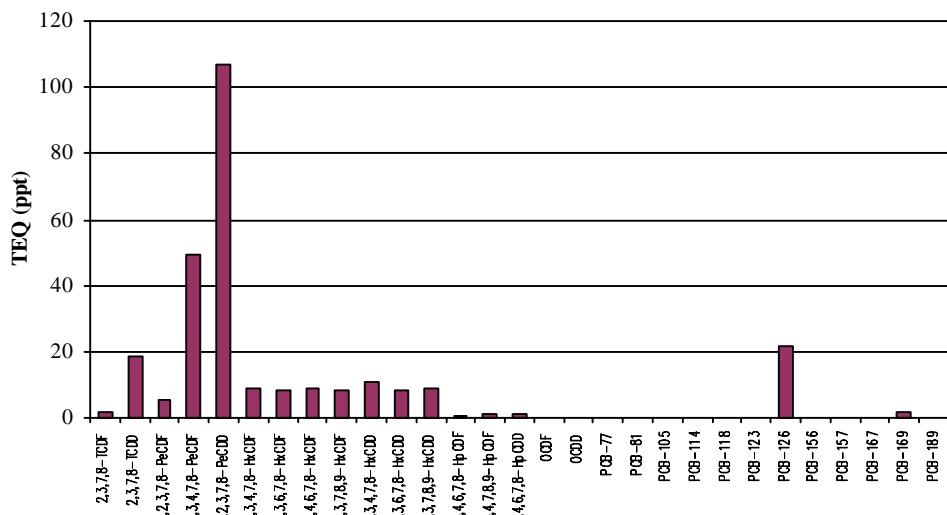
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

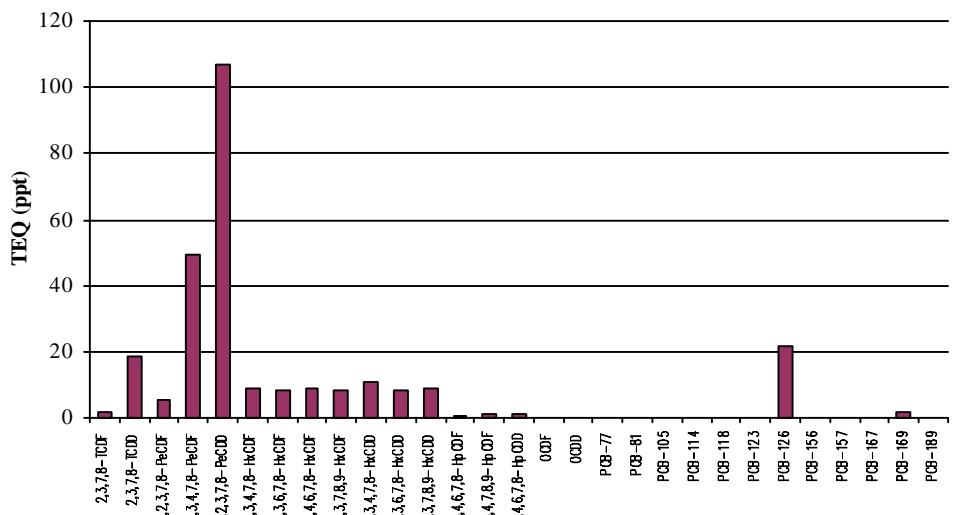
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

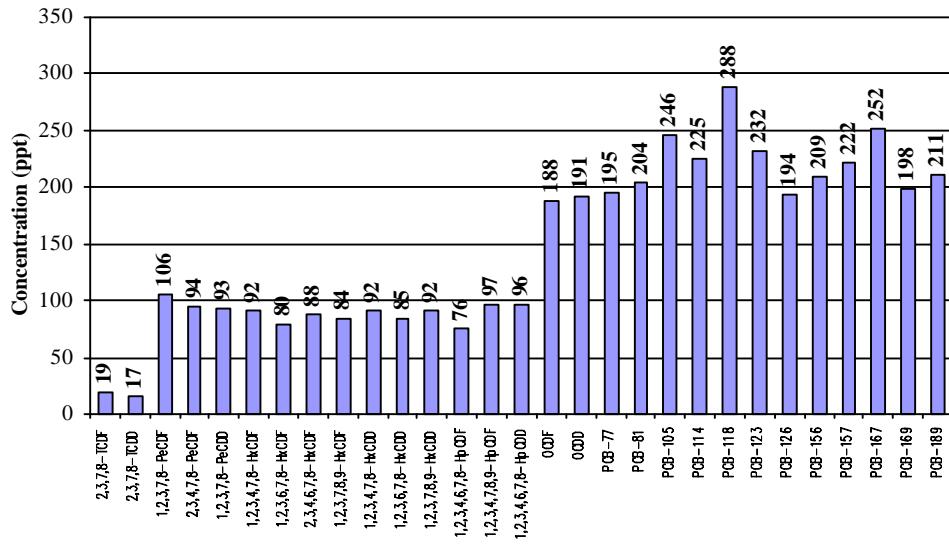
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

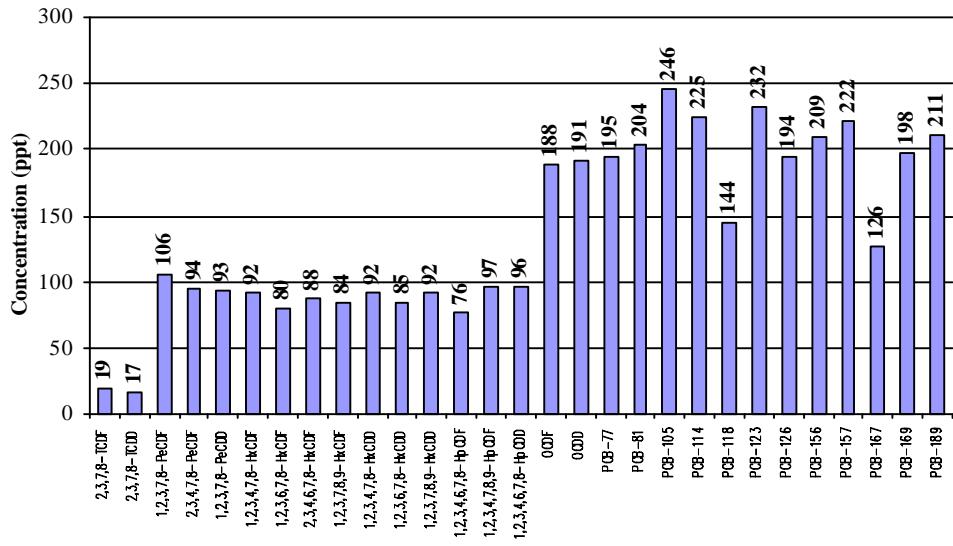


Appendix B4. Congener Profiles for QC Samples**Sample GAAXLCS****Lab Spike****Full Concentrations: Congener Profile**

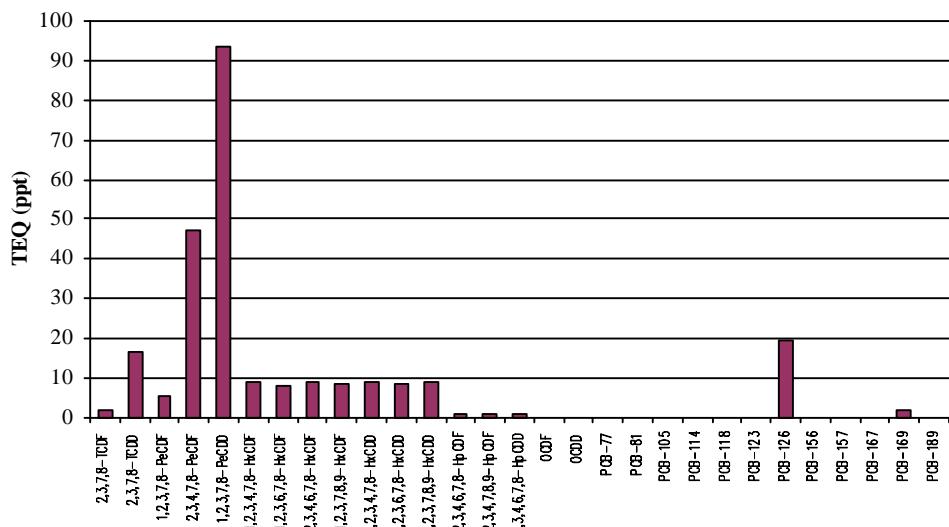
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

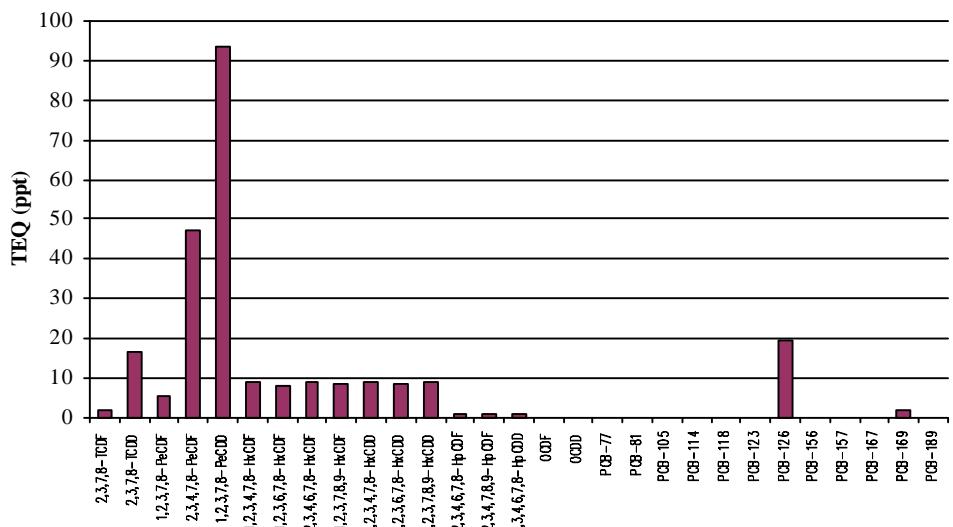
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

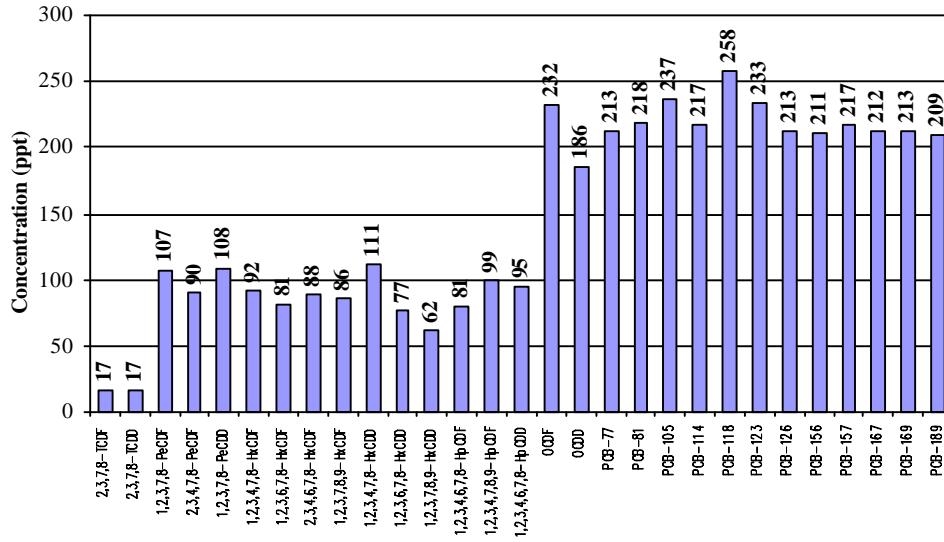


Appendix B4. Congener Profiles for QC Samples

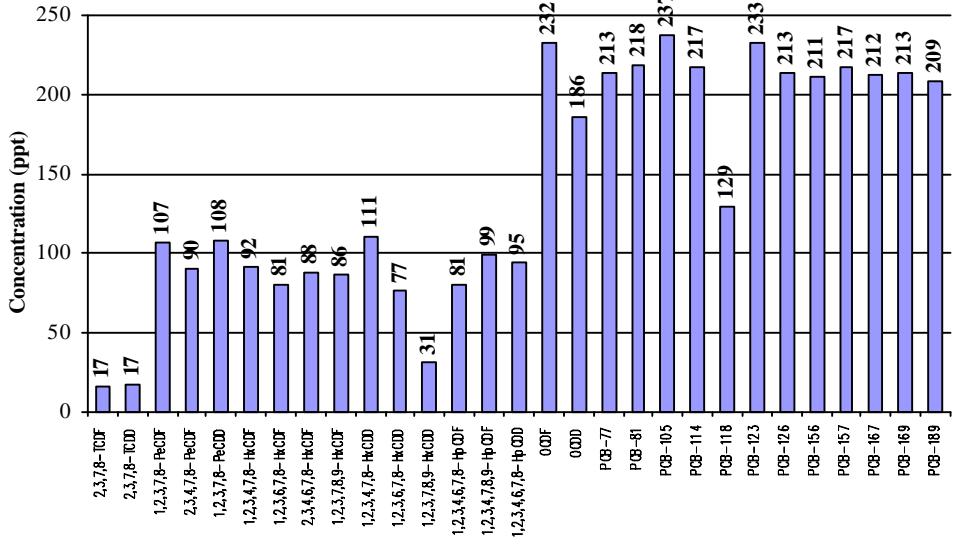
FINAL

Sample GAAYLCS**Lab Spike****Full Concentrations: Congener Profile**

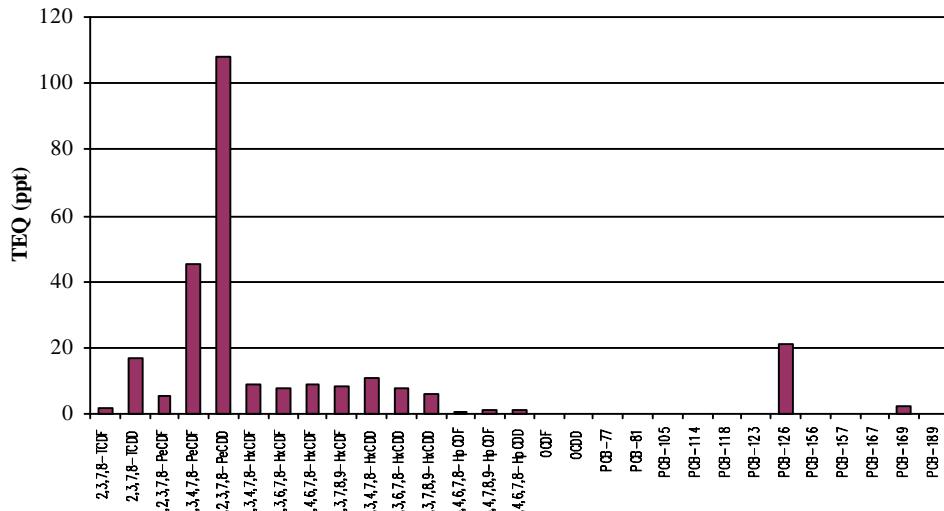
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

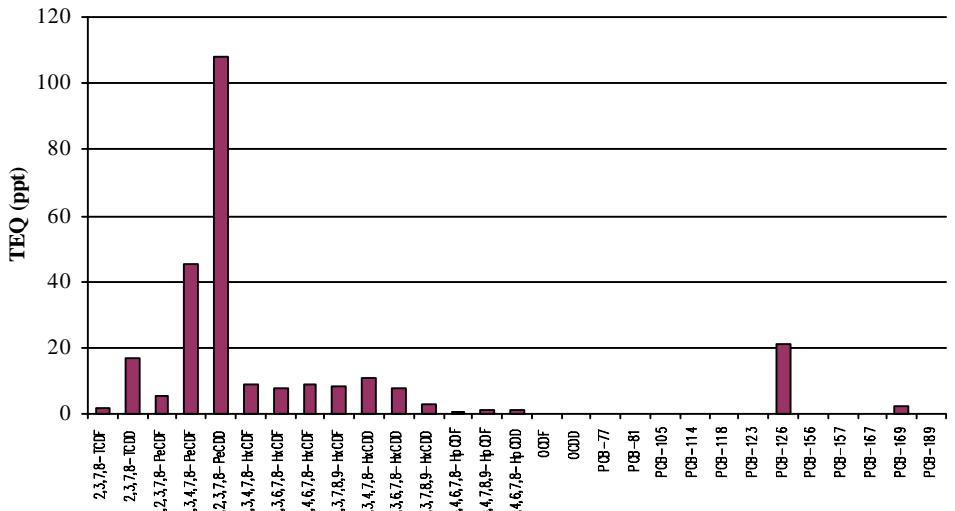
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

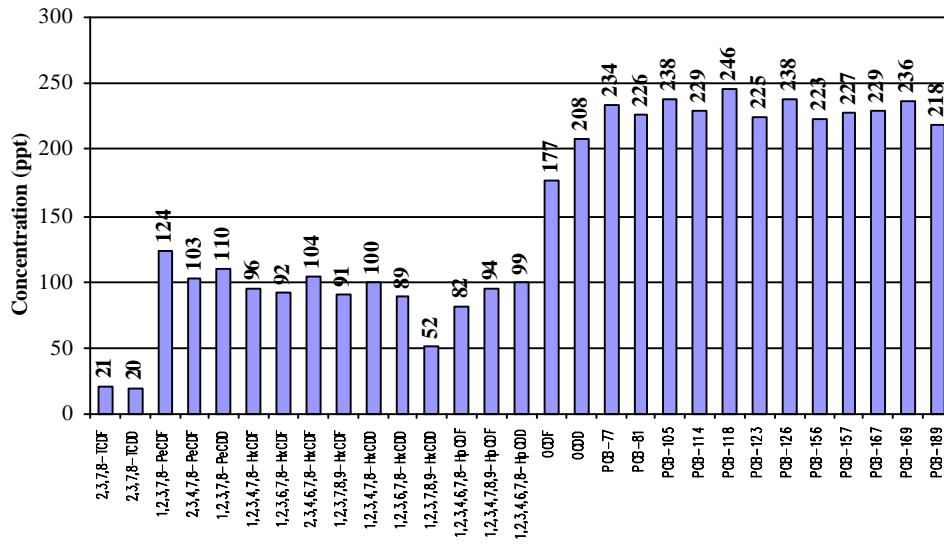
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

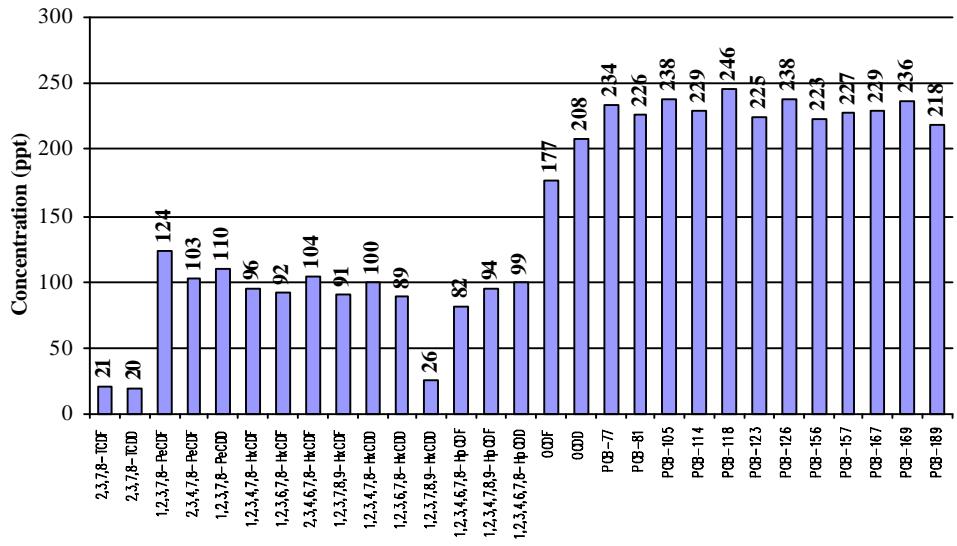


Appendix B4. Congener Profiles for QC Samples**Sample GBAELCS****Lab Spike****Full Concentrations: Congener Profile**

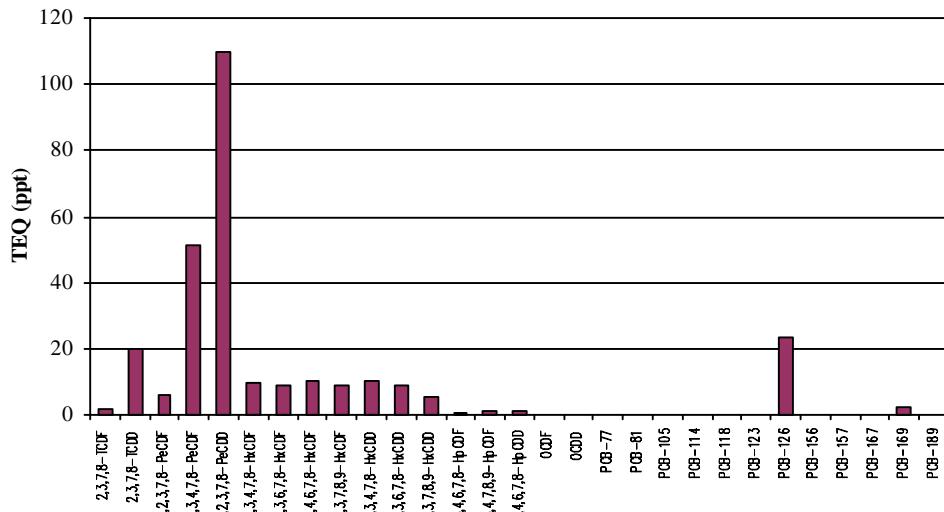
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

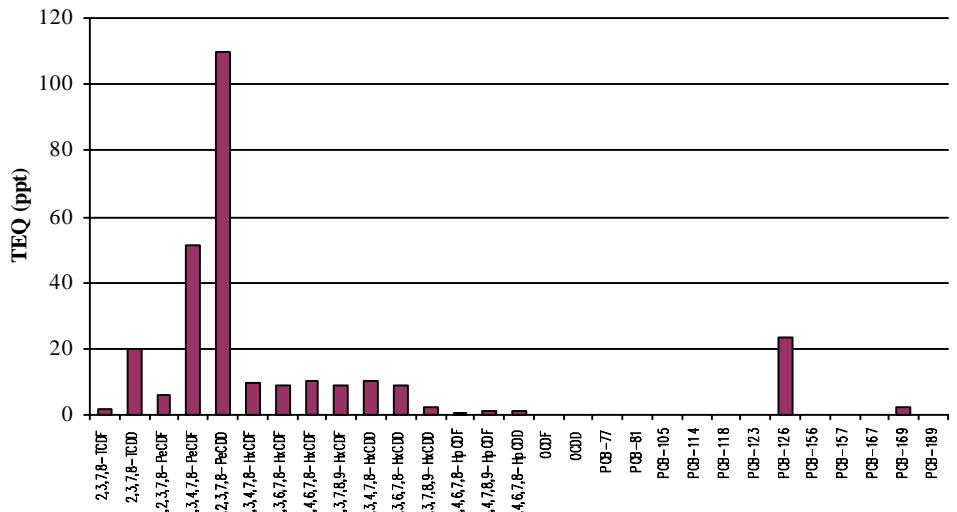
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

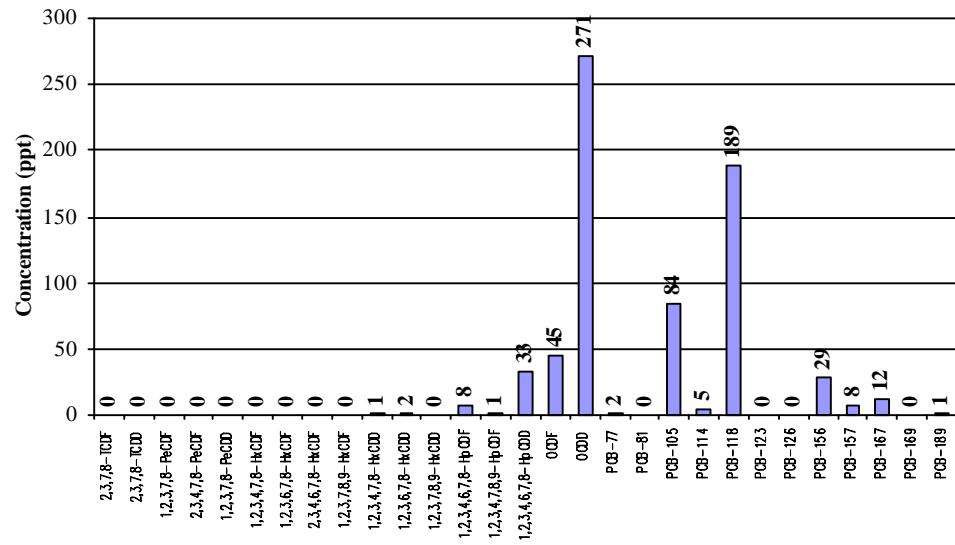


Appendix B4. Congener Profiles for QC Samples

Sample 113 Ref-F-22 PE Clean

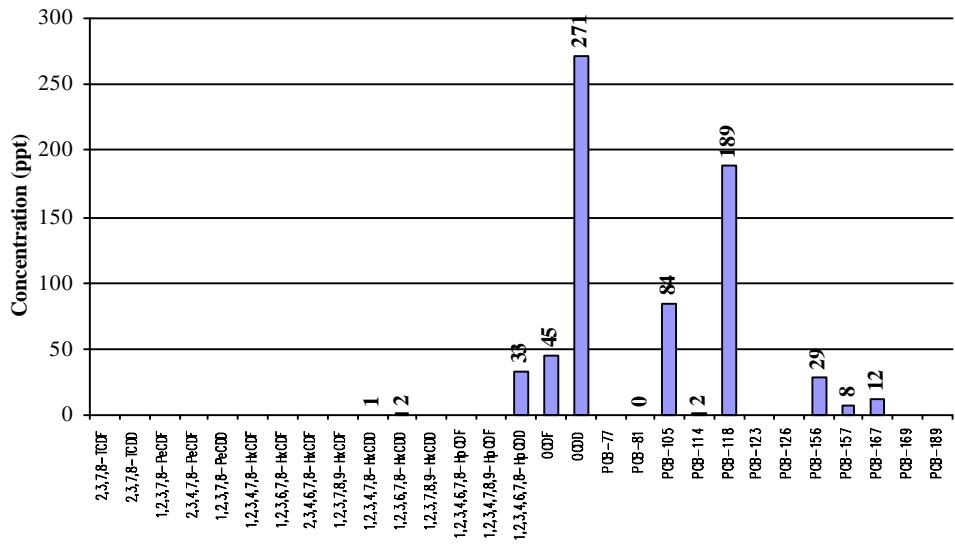
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



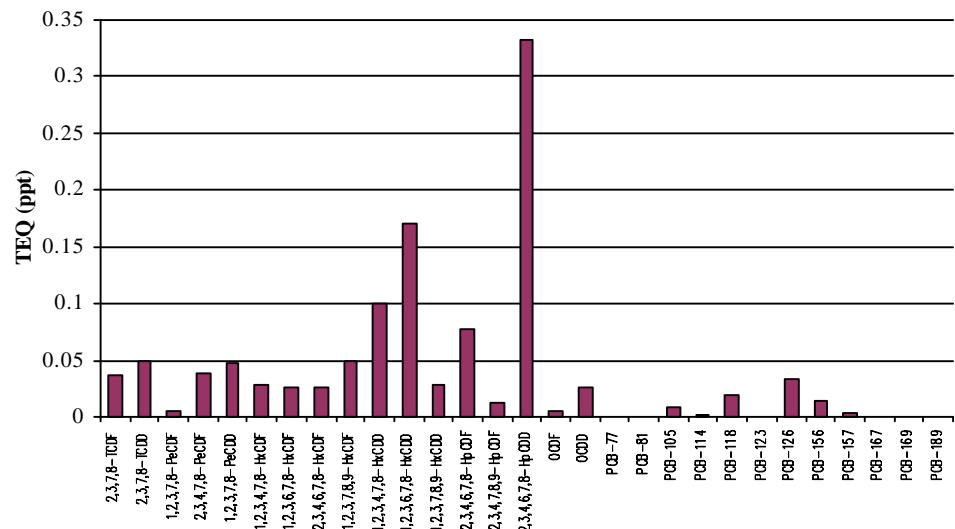
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



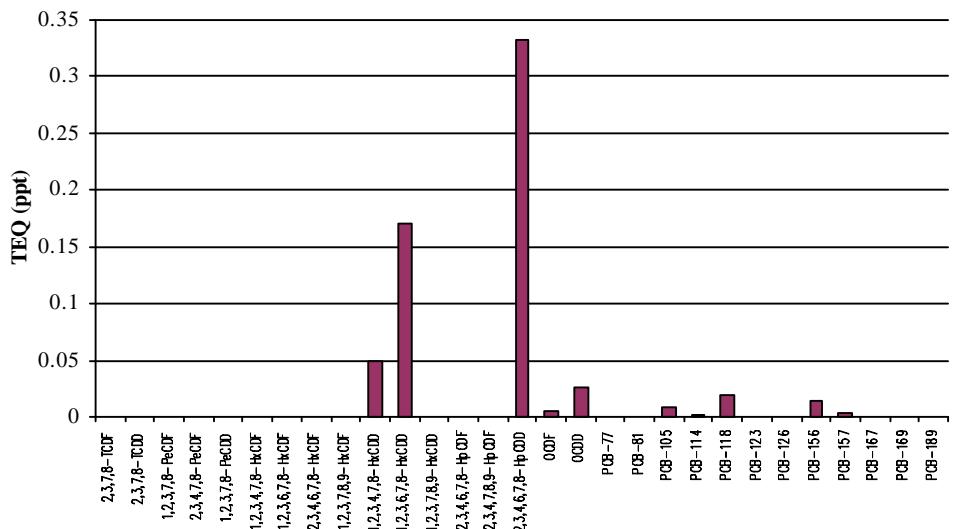
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)

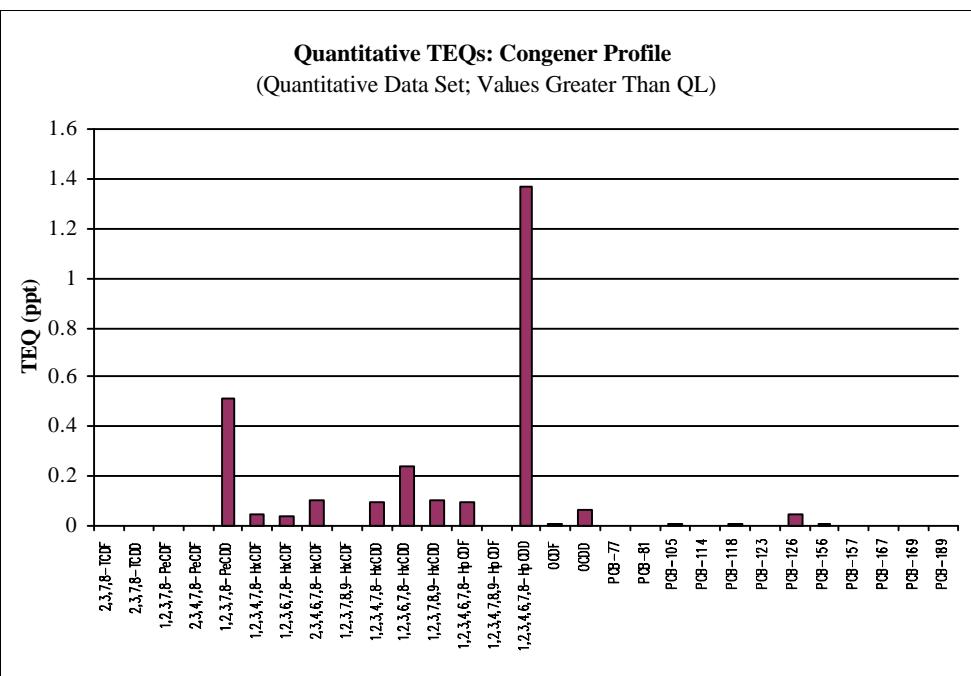
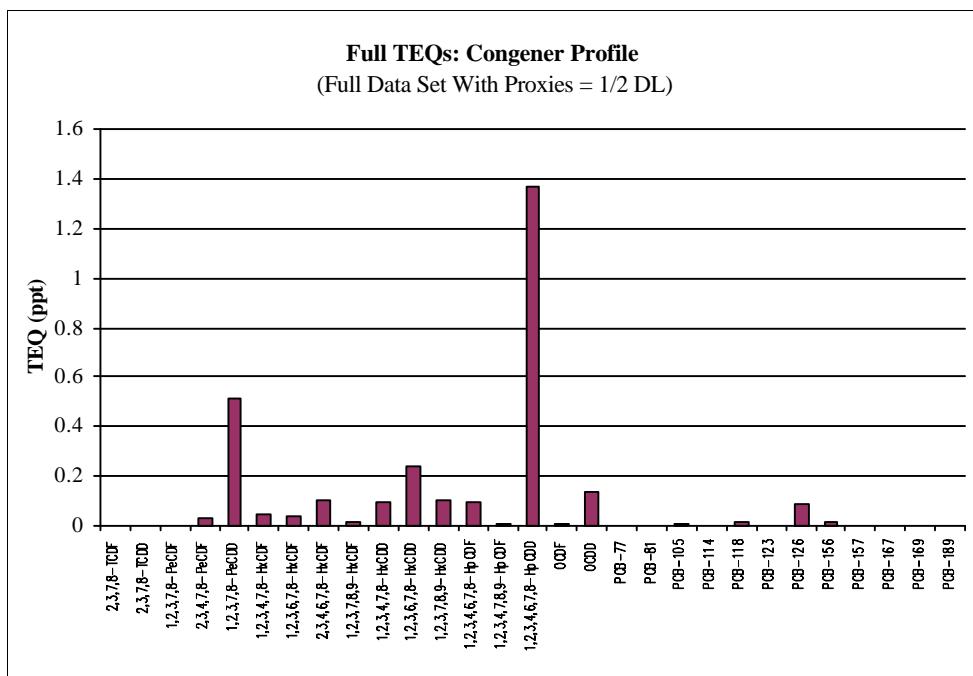
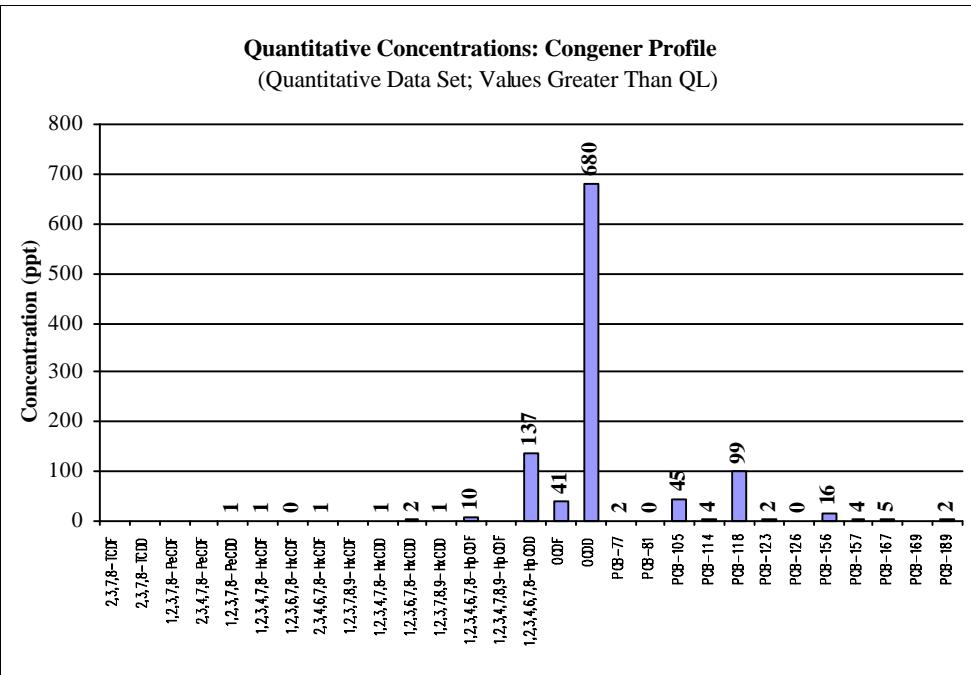
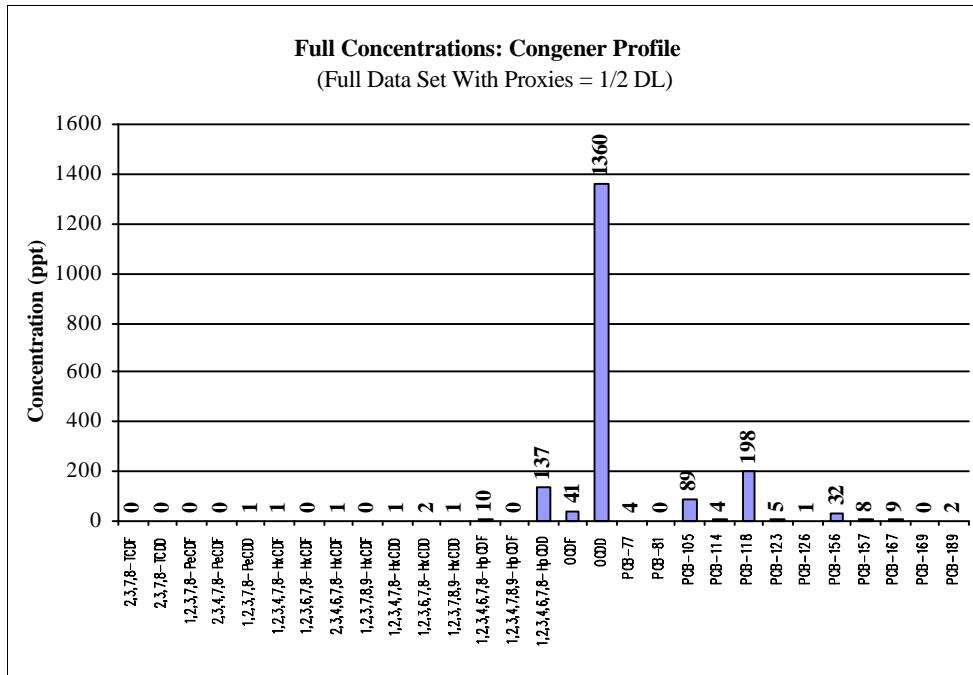


Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



Sample 172 *Ref-F-23 PE Clean*

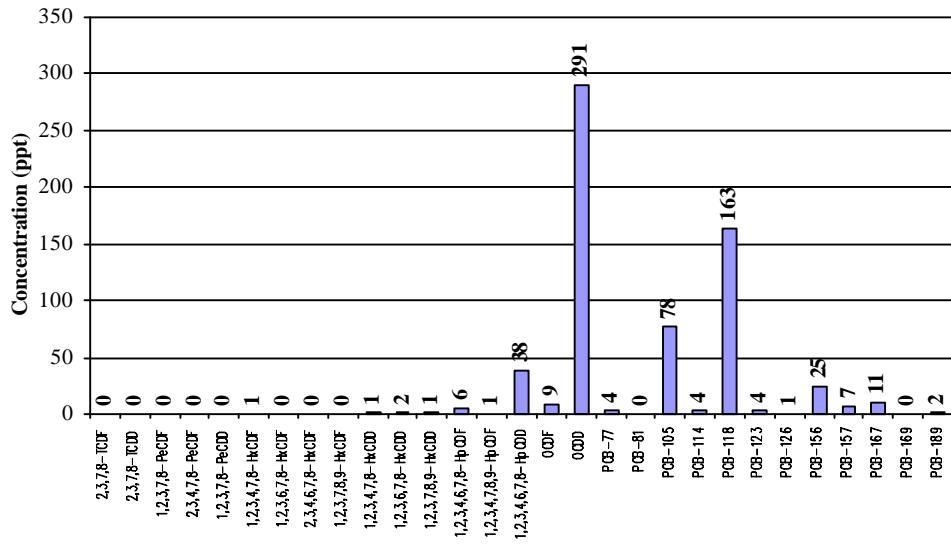


Appendix B4. Congener Profiles for QC Samples

Sample 256 Ref-F-24 PE Clean

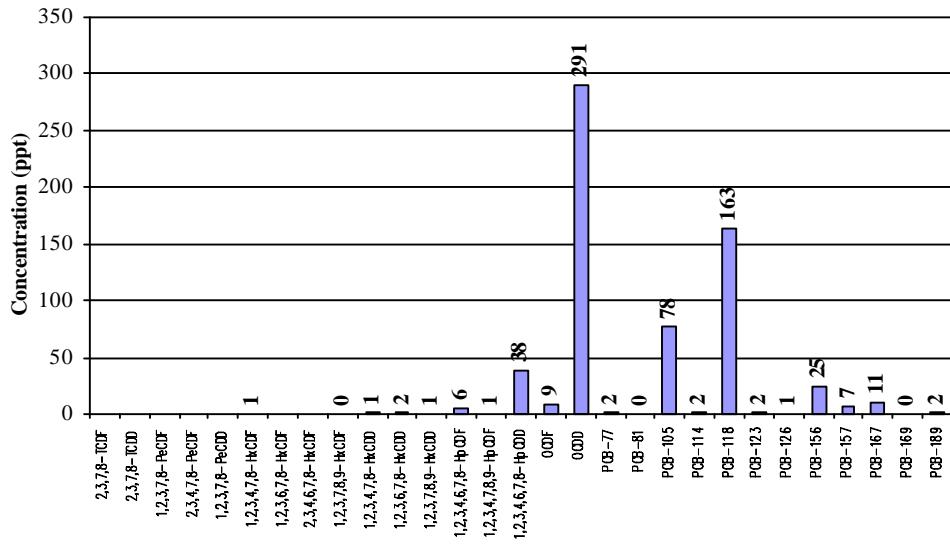
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



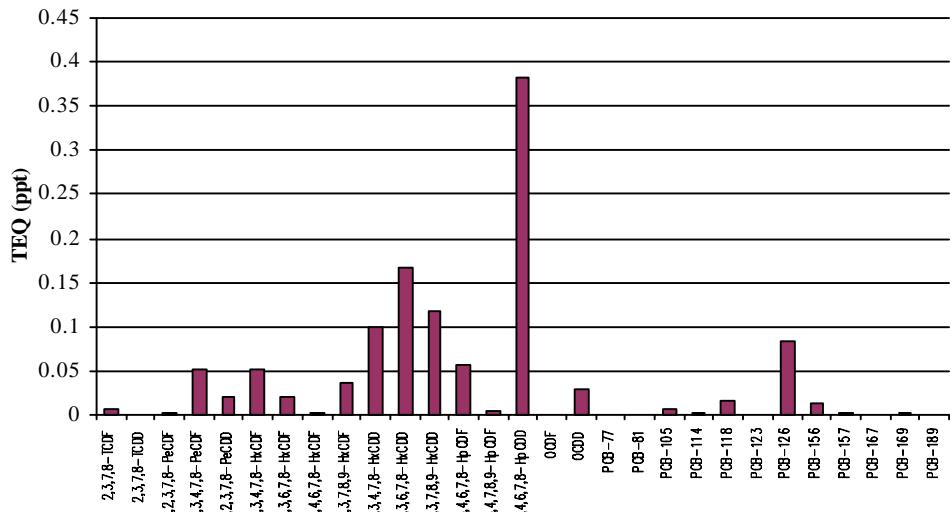
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



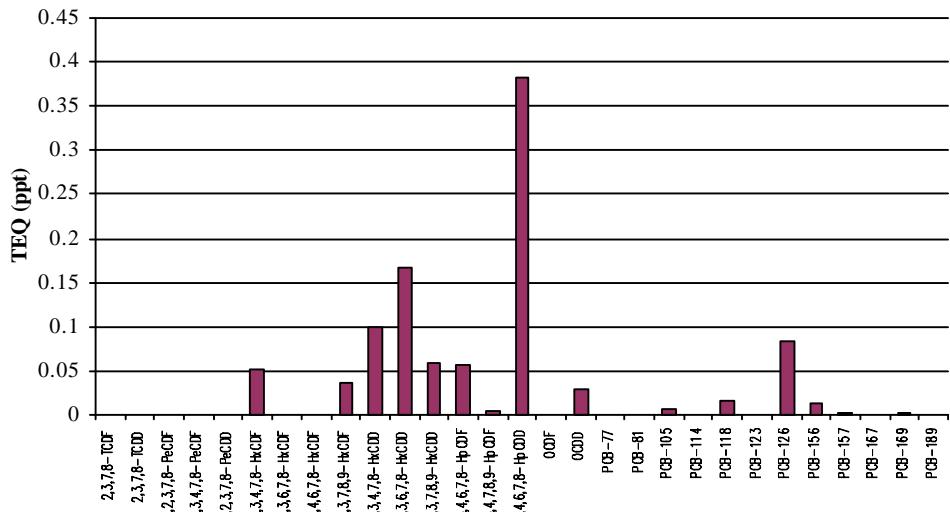
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)

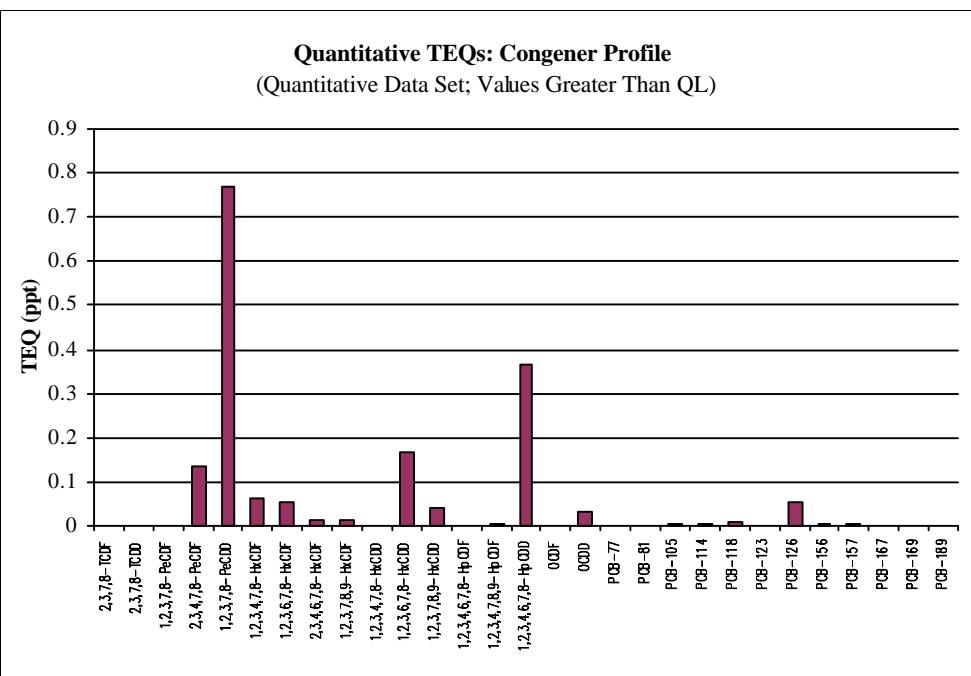
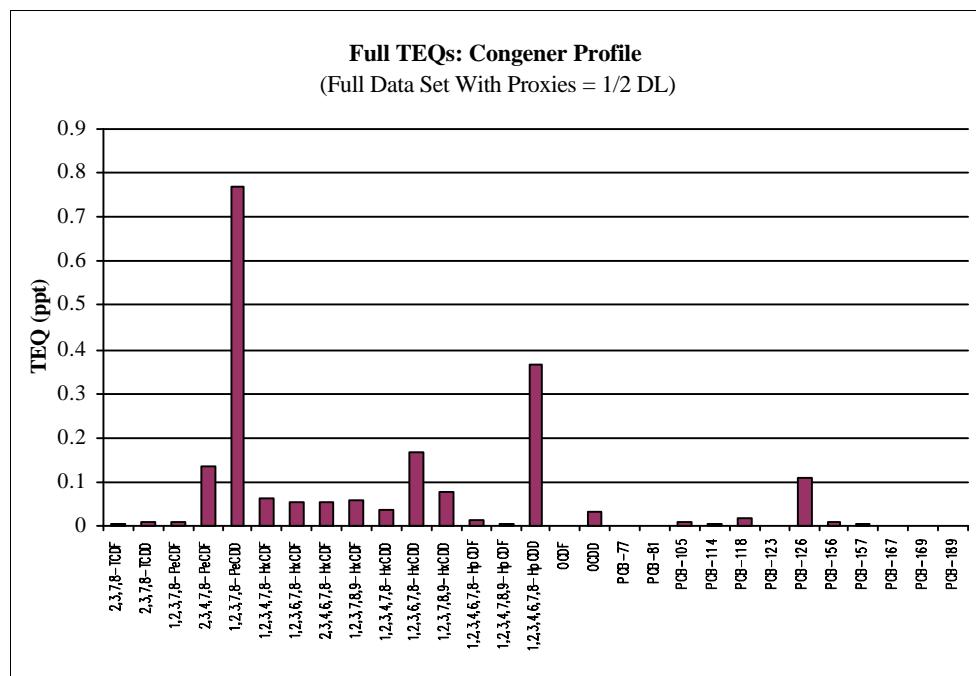
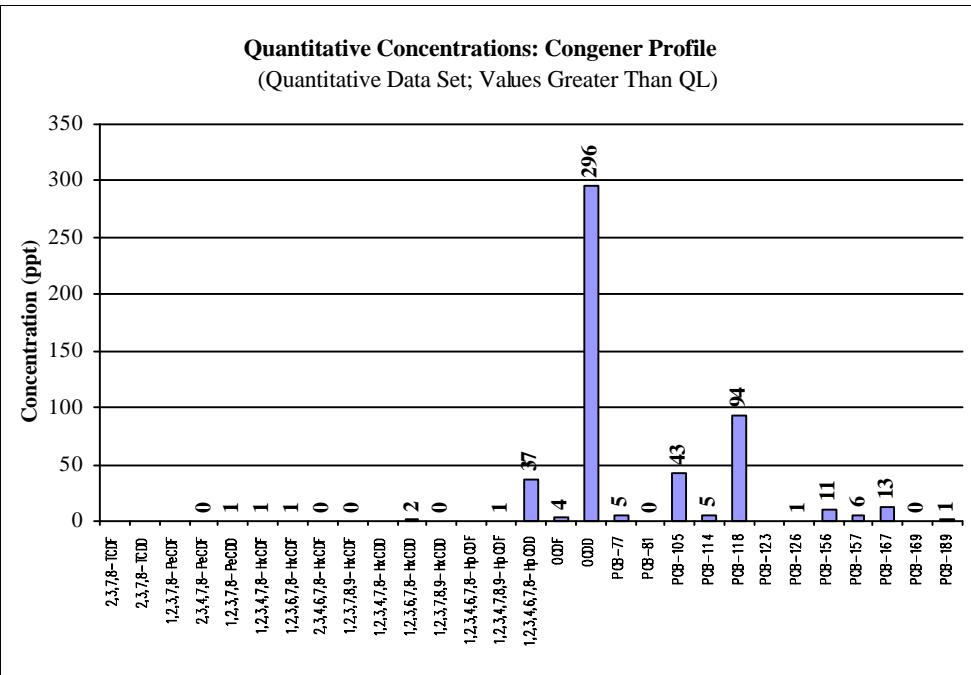
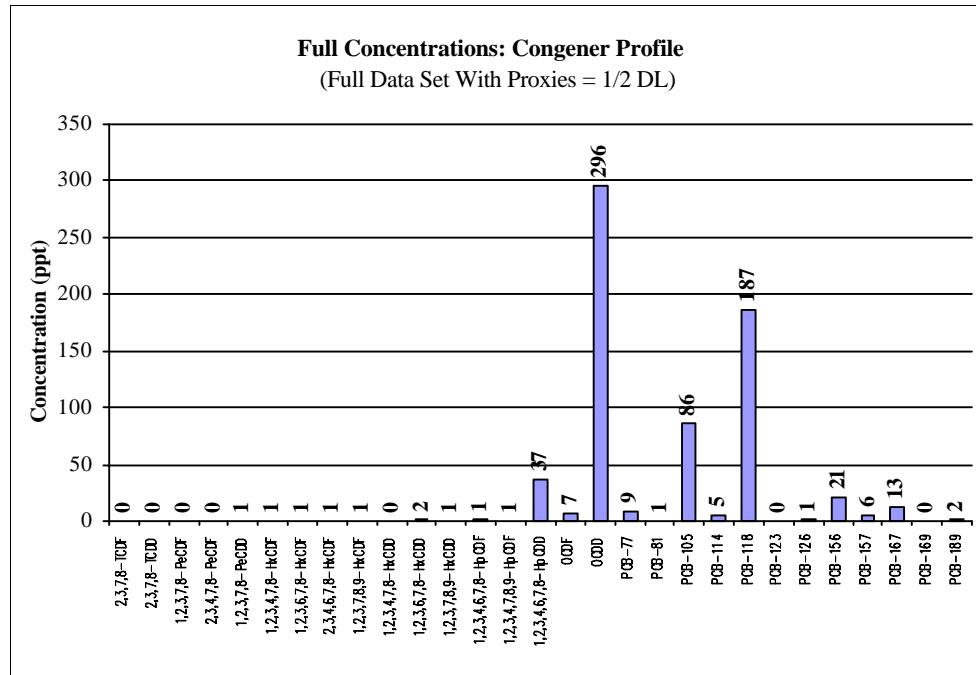


Quantitative TEQs: Congener Profile

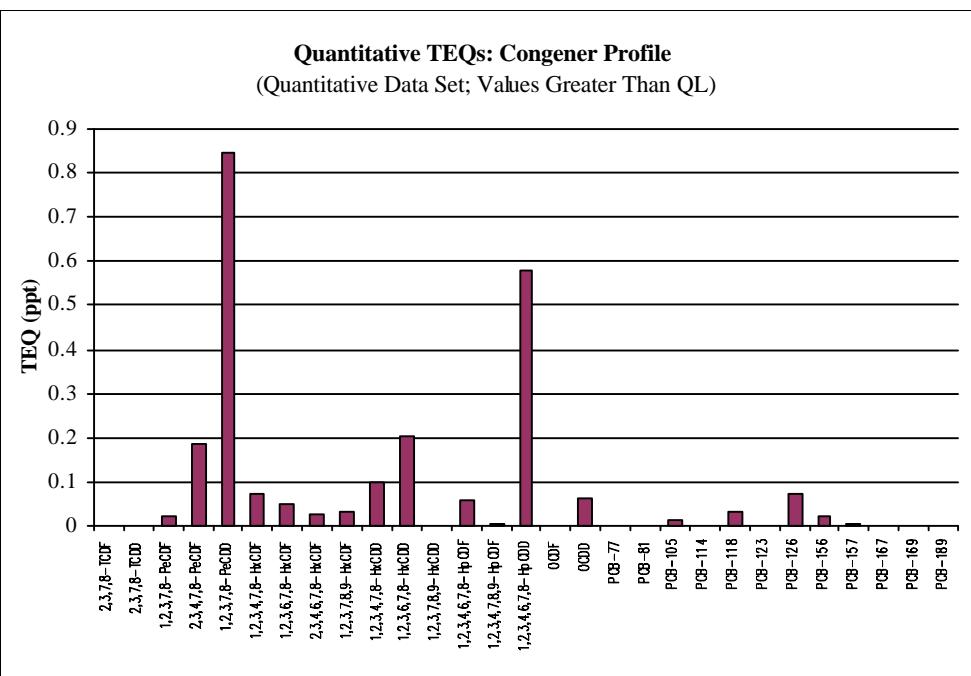
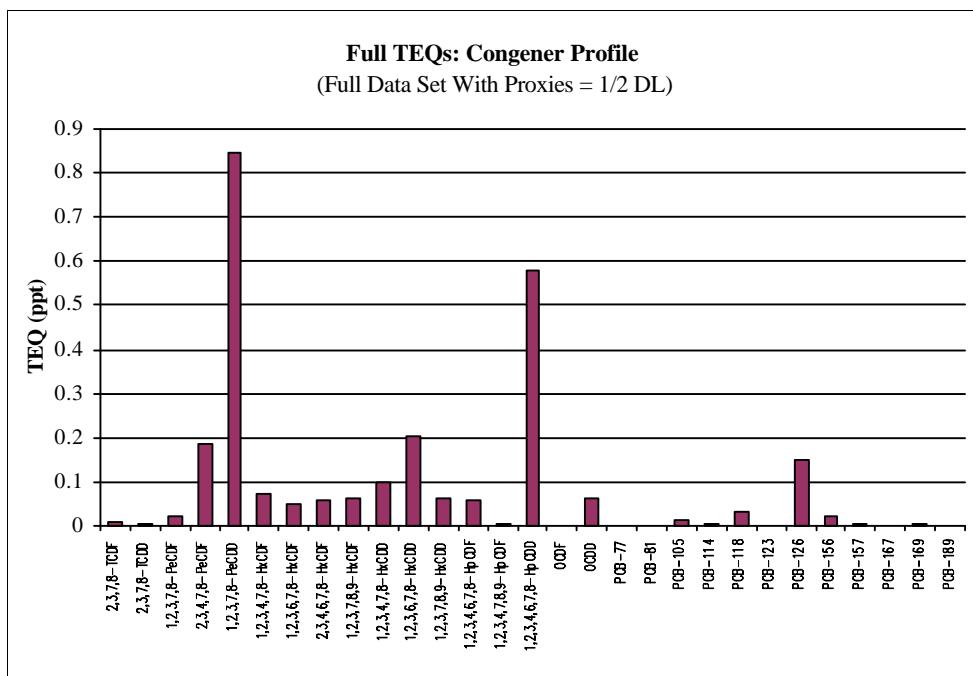
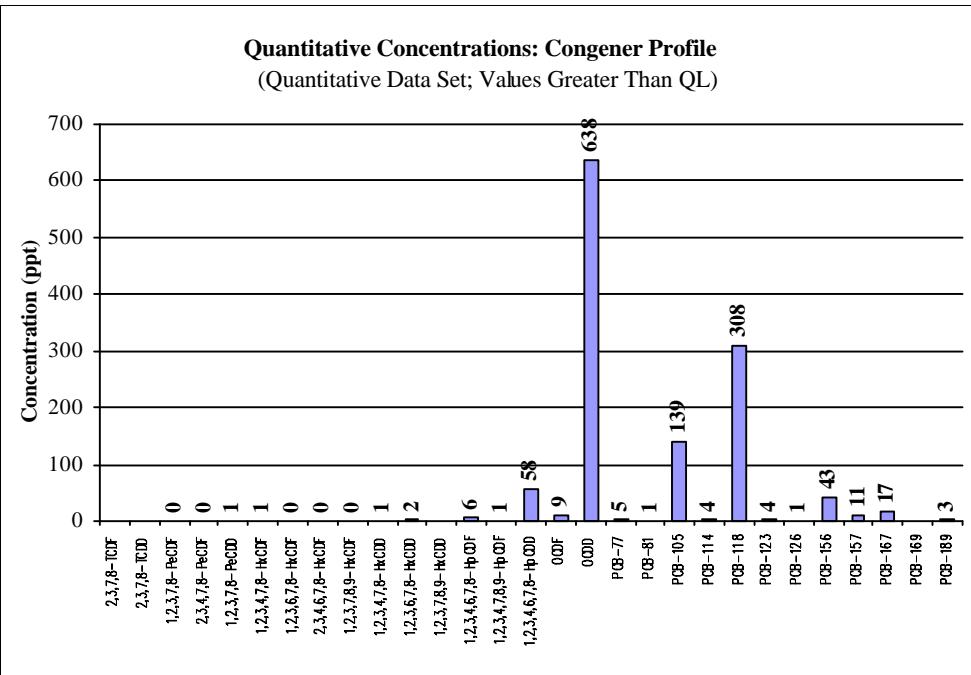
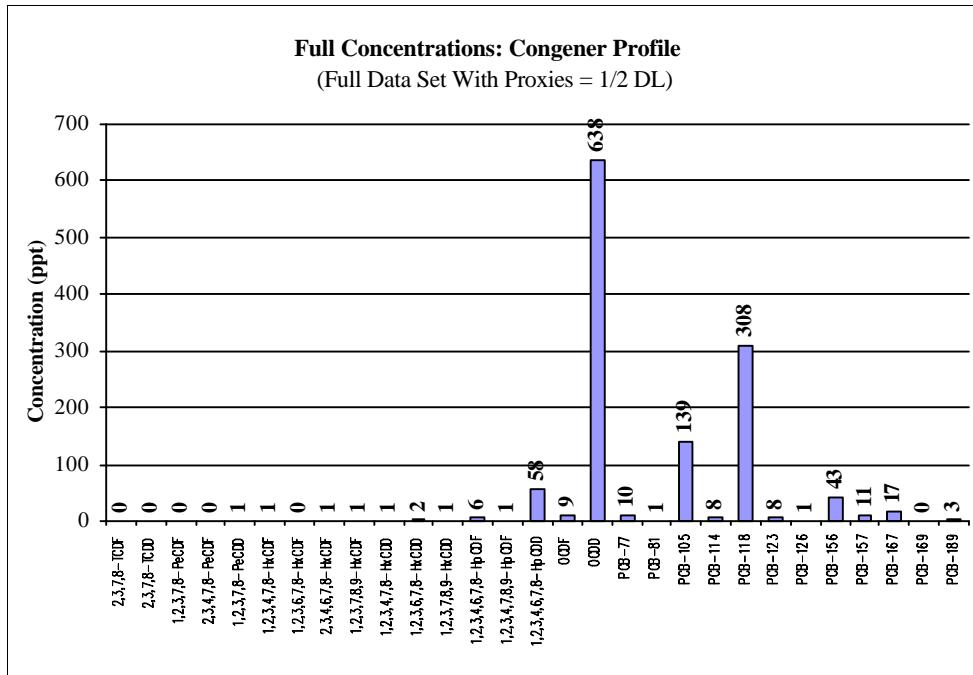
(Quantitative Data Set; Values Greater Than QL)



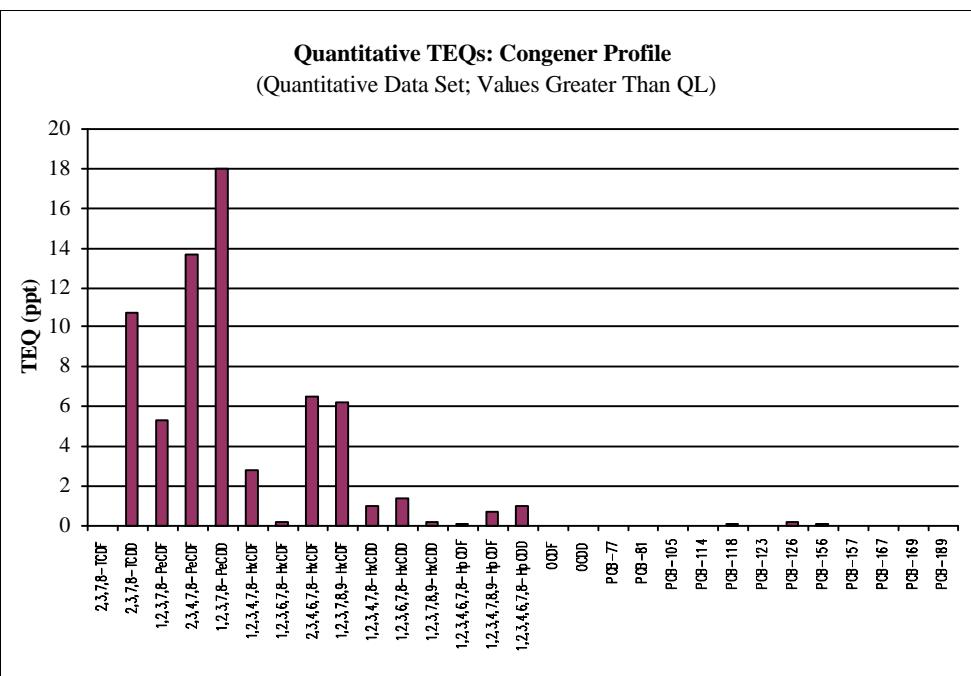
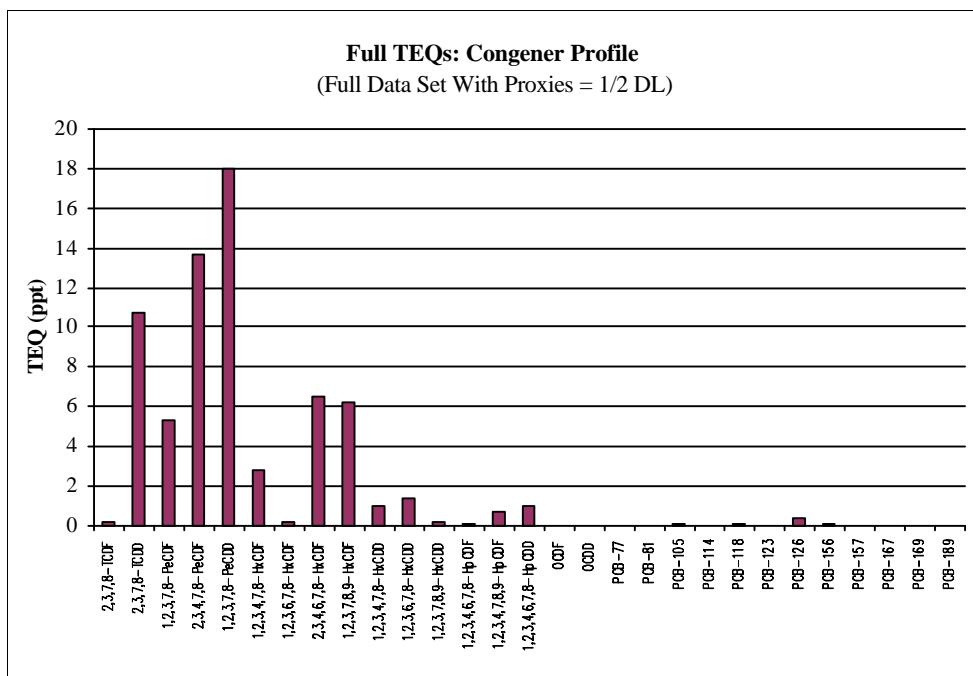
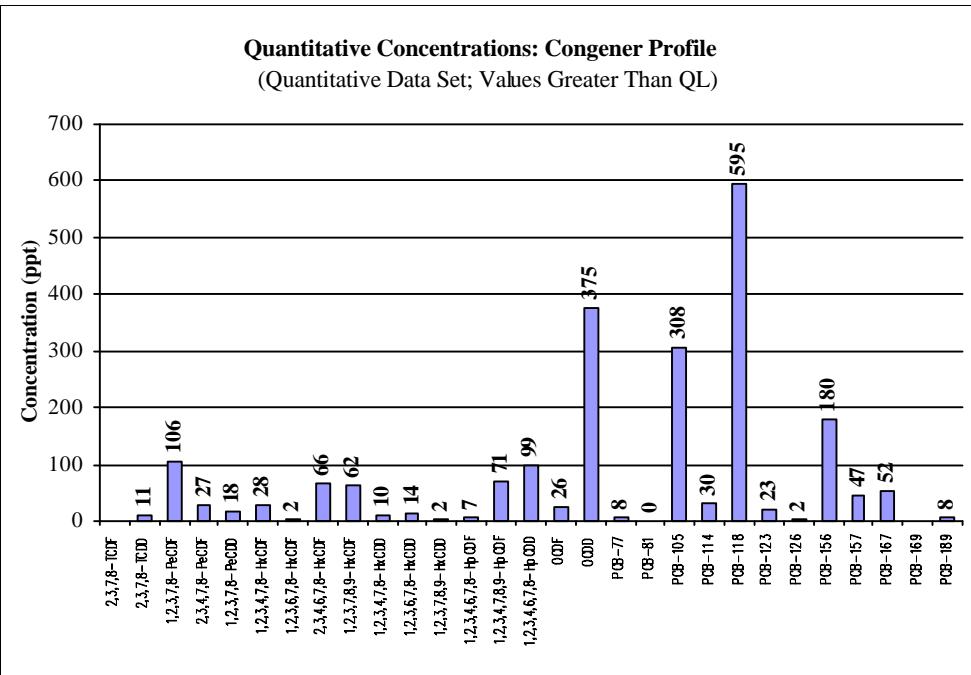
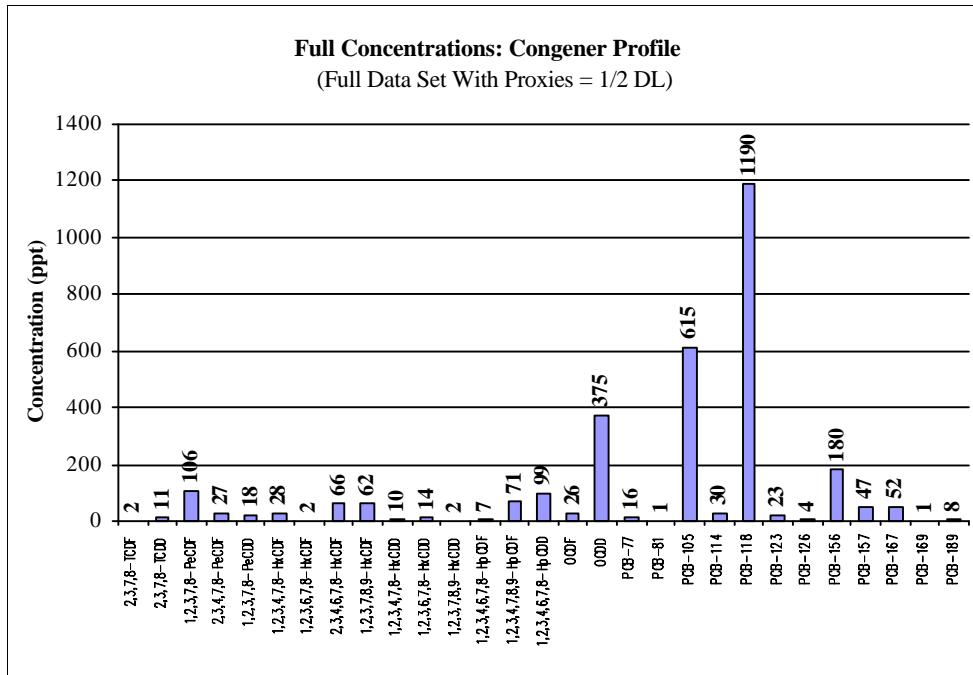
Sample 339 *Ref-F-27 PE Clean*



Sample **681** *blank* *PE Clean*

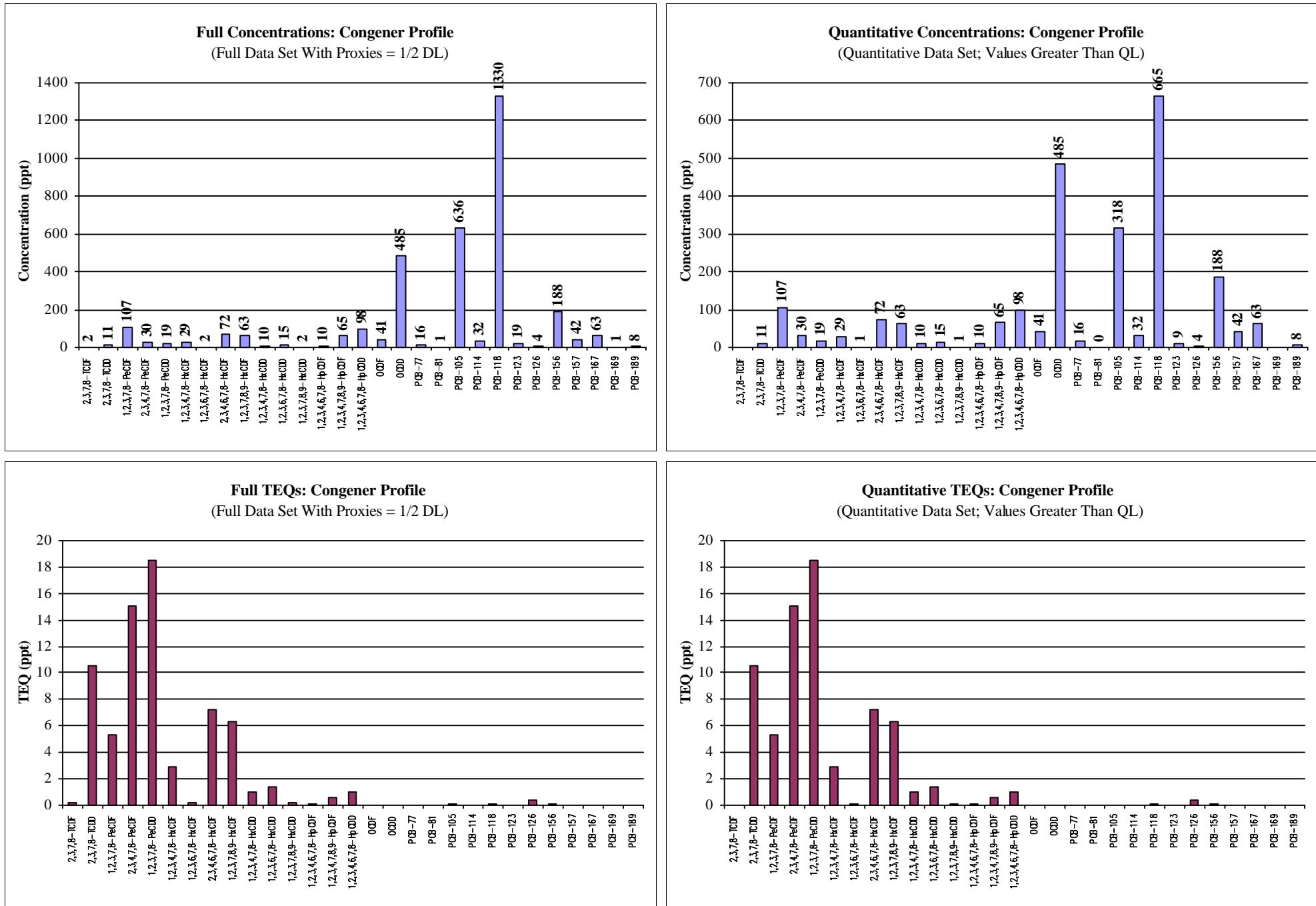


Sample 263 PEL-F-11 PE Low Std



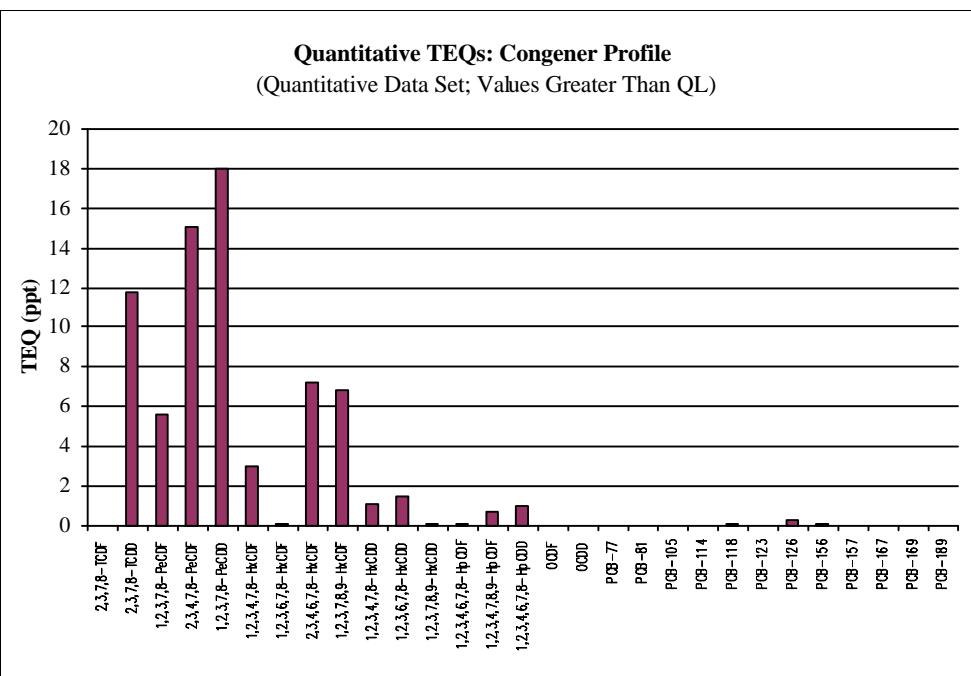
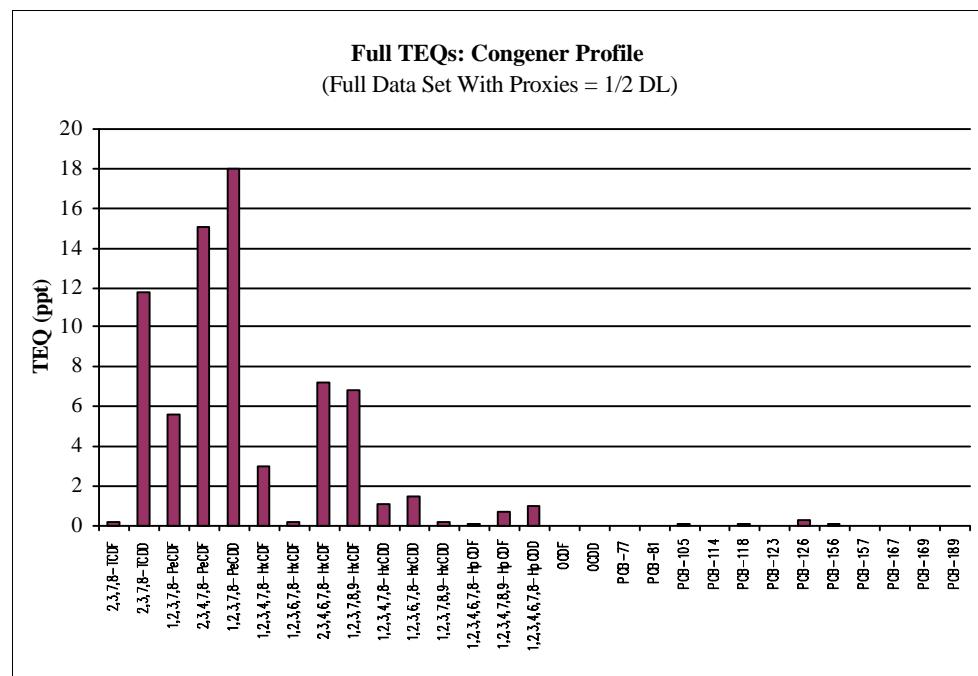
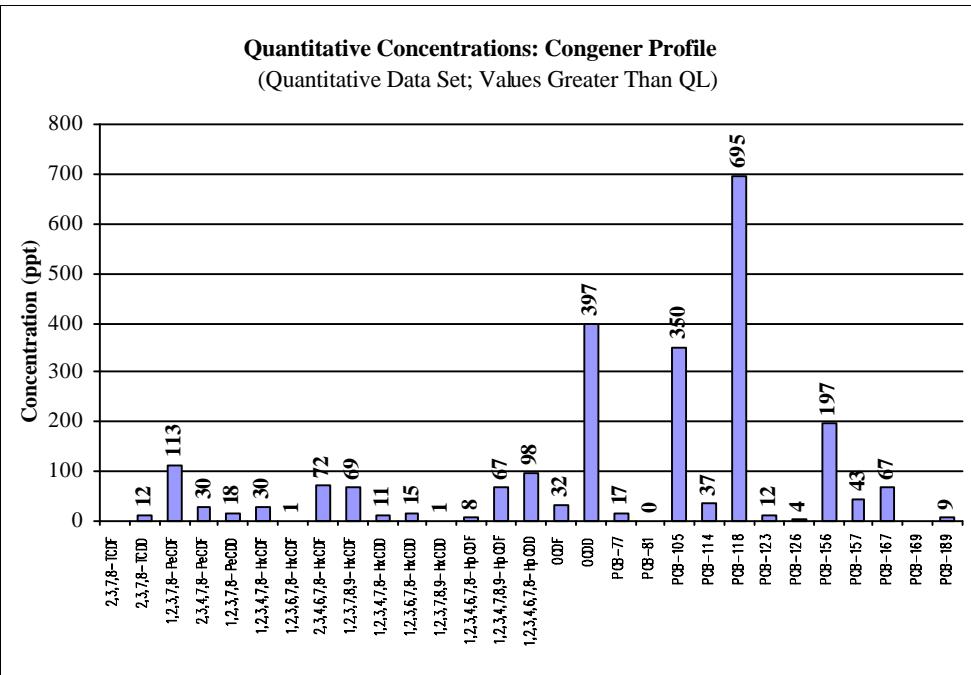
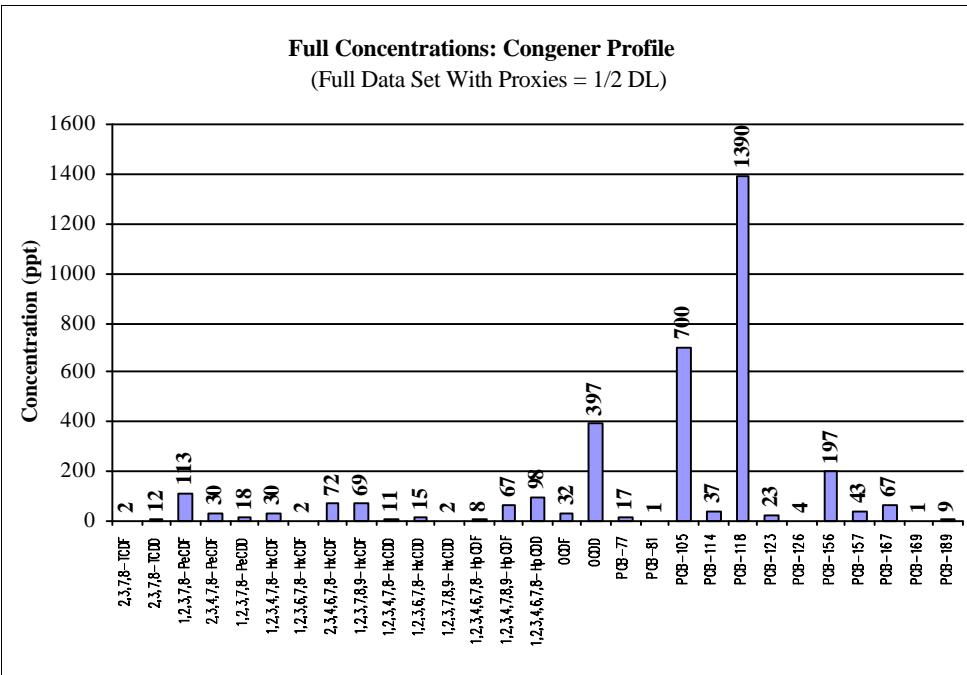
Appendix B4. Congener Profiles for QC Samples

Sample 498 PEL-F-12 PE Low Std



Sample 757-R PEL-F-7 PE Low Std

Replacement sample for (757) which was lost by MRI; EPA batch C, sent w/ off-post

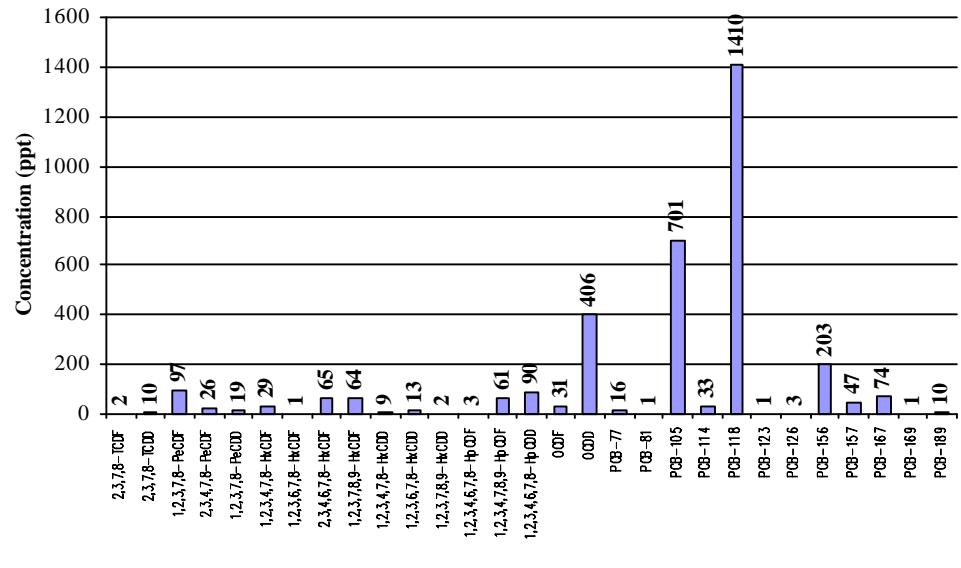


Appendix B4. Congener Profiles for QC Samples

Sample 943 PEL-F-10 PE Low Std

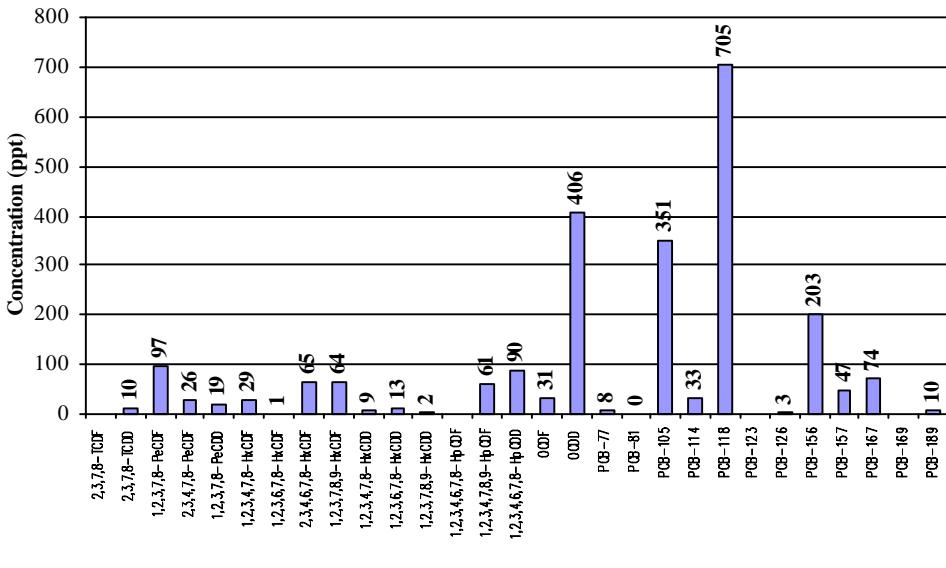
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



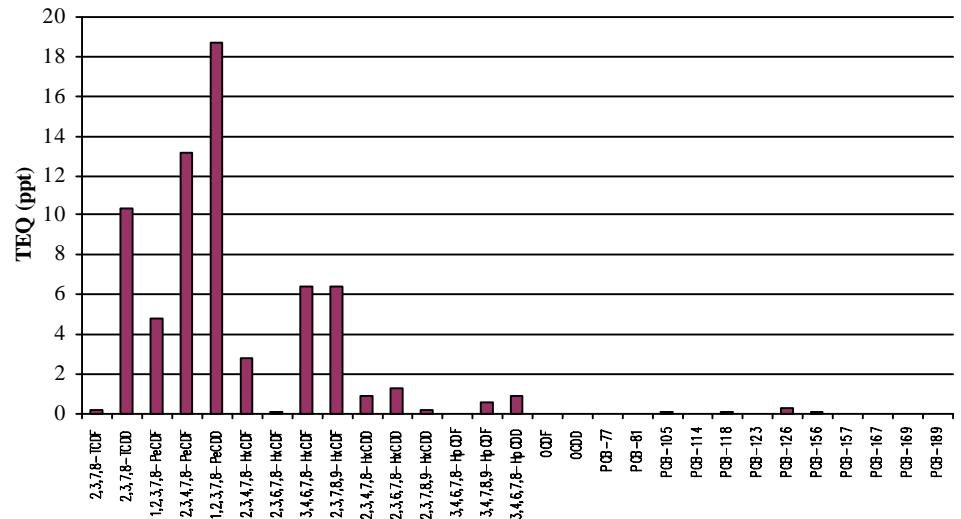
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



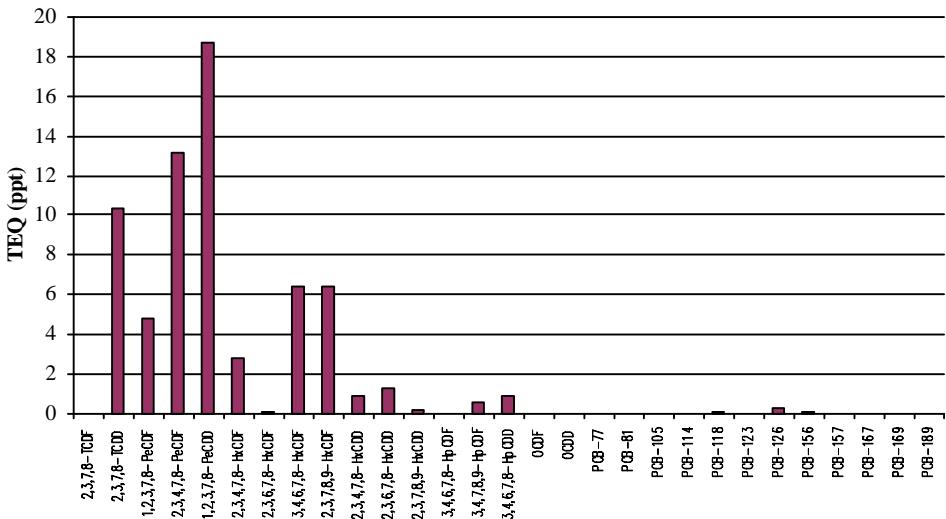
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)

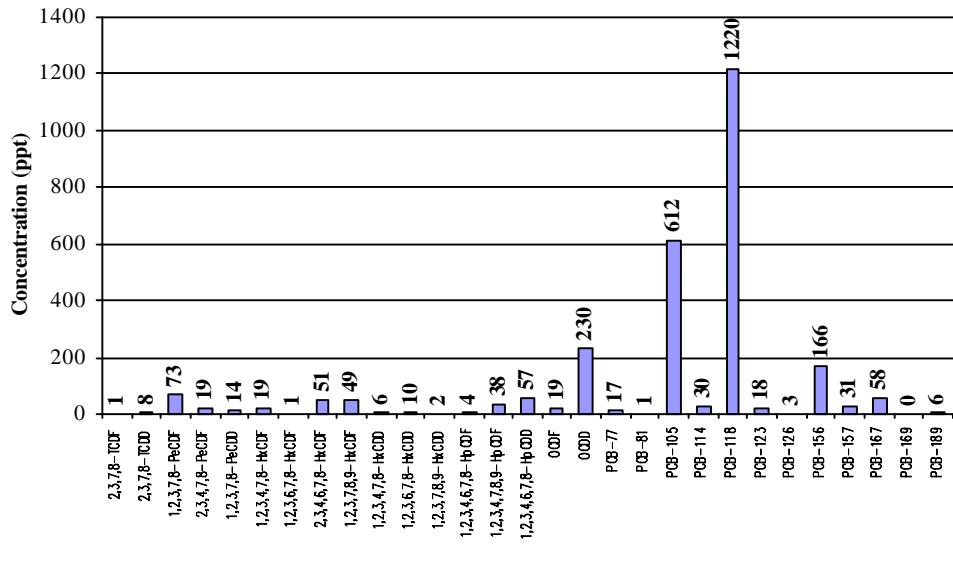


Appendix B4. Congener Profiles for QC Samples

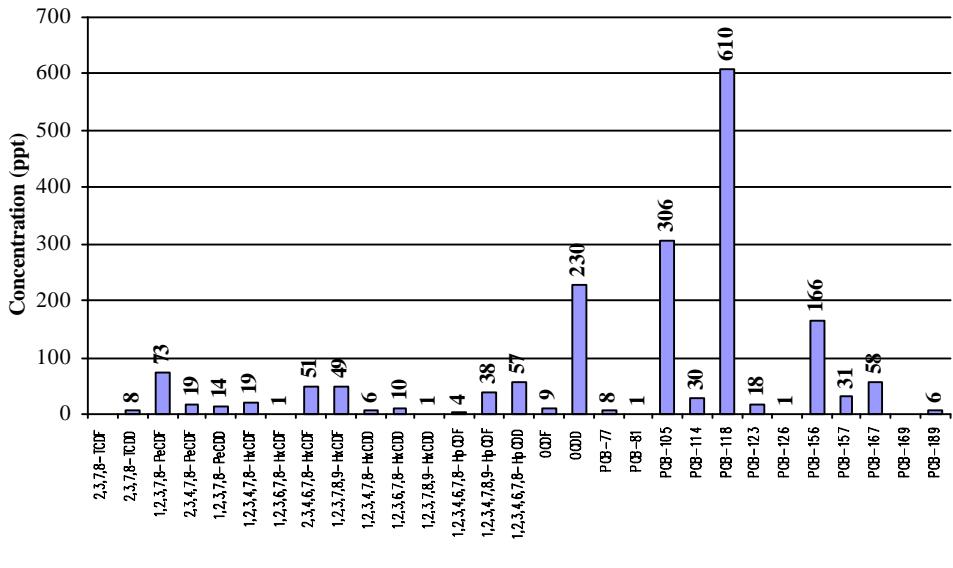
Sample PC00268 *PEL* *PE Low Std*

Full Concentrations: Congener Profile

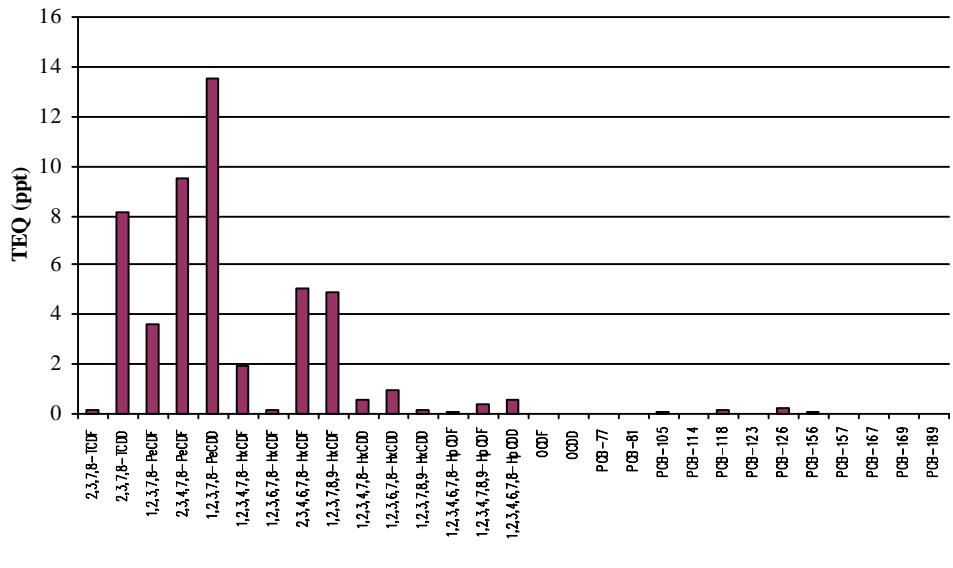
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

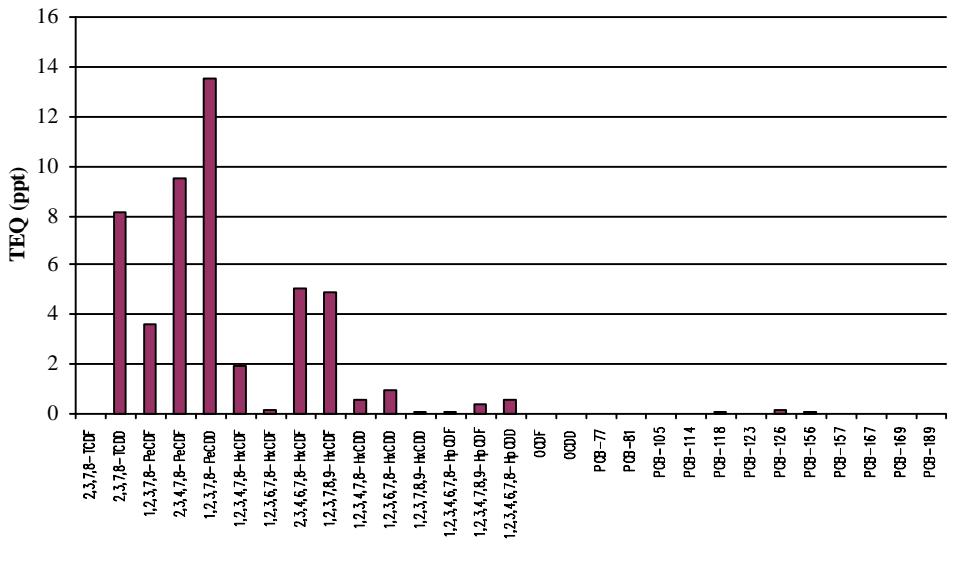
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

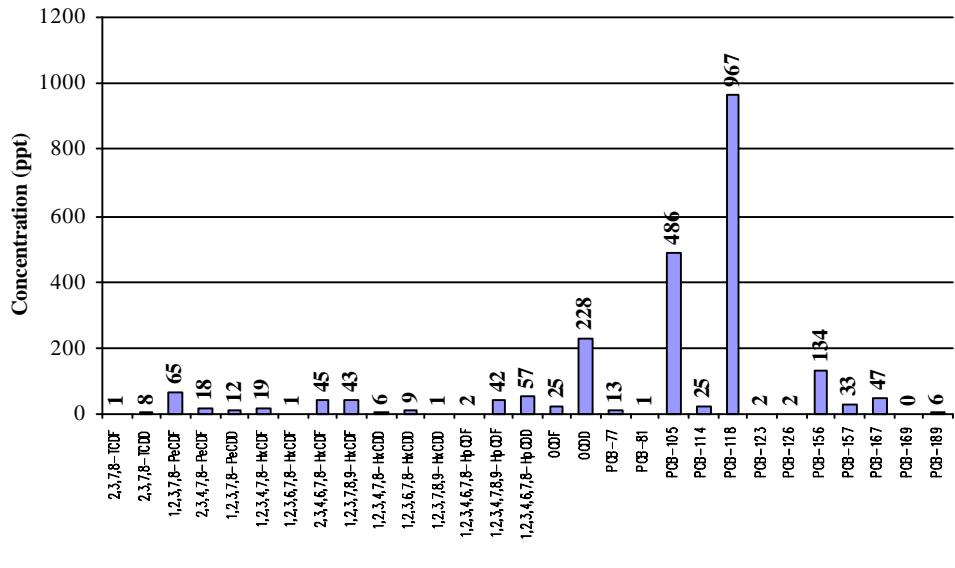
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

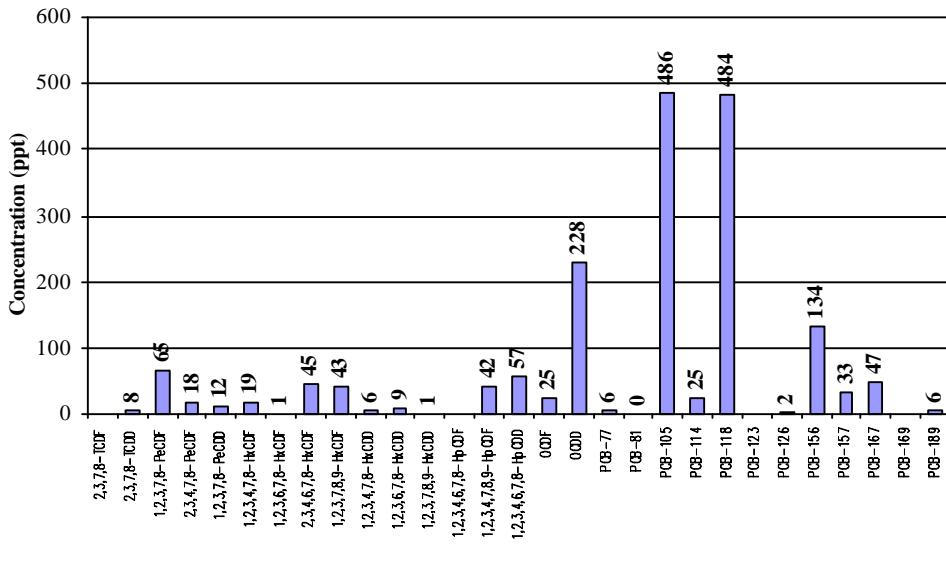


Appendix B4. Congener Profiles for QC Samples**Sample PC00359 PEL PE Low Std****Full Concentrations: Congener Profile**

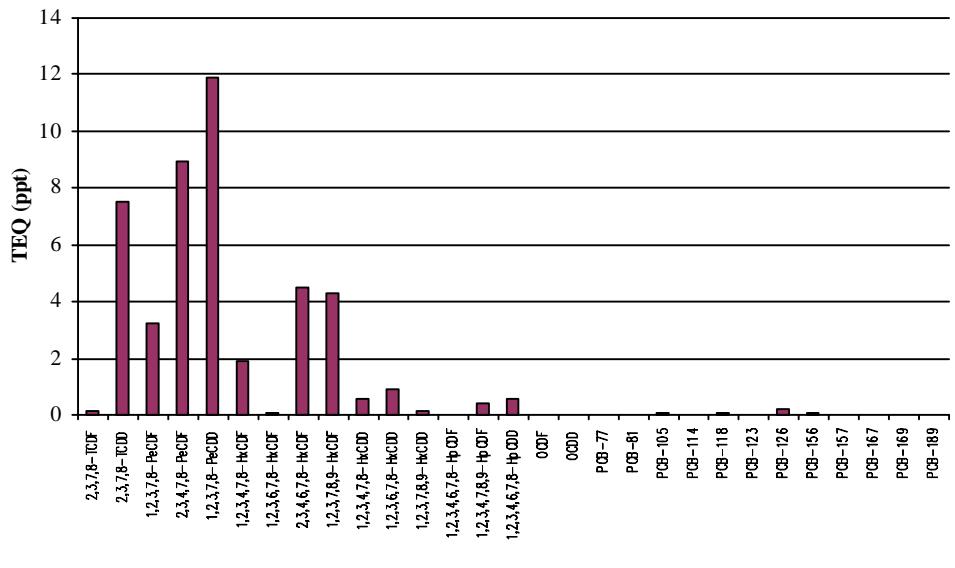
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

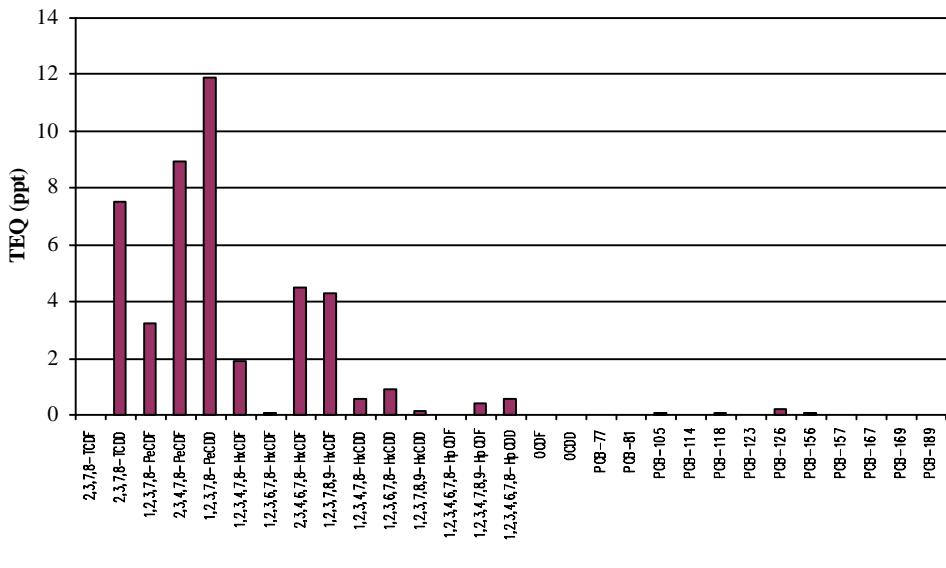
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

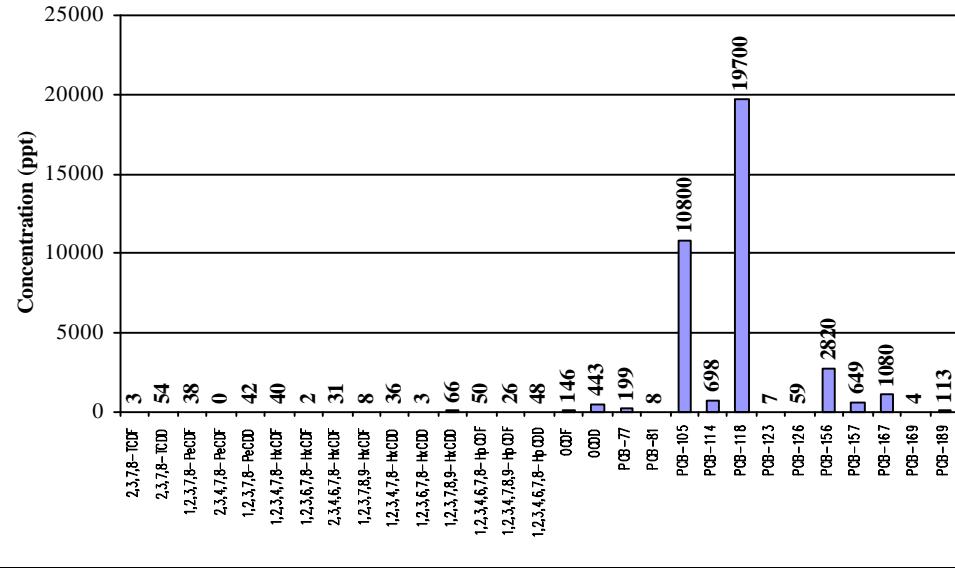
**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

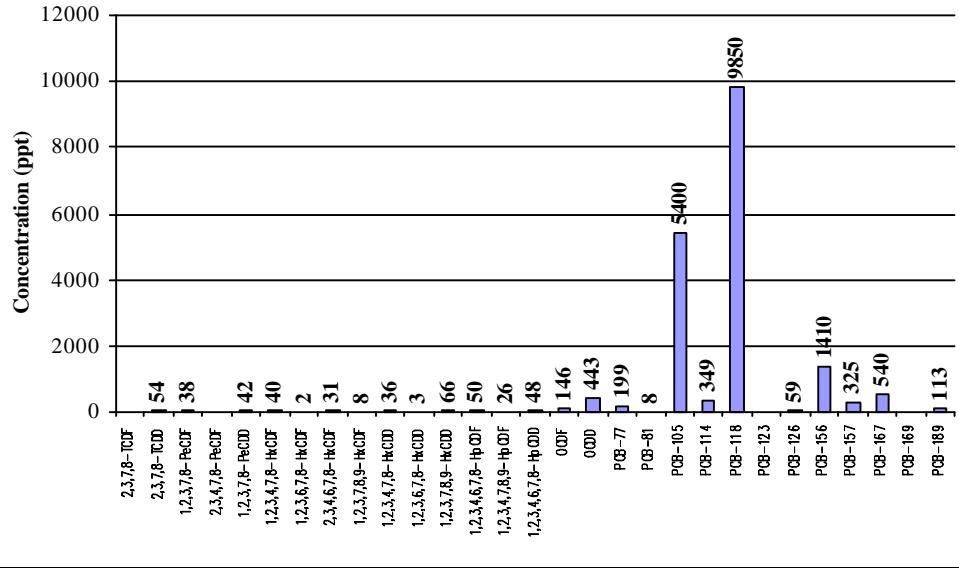


Appendix B4. Congener Profiles for QC Samples**Sample 201 PEM-F-10 PE Med Std****Full Concentrations: Congener Profile**

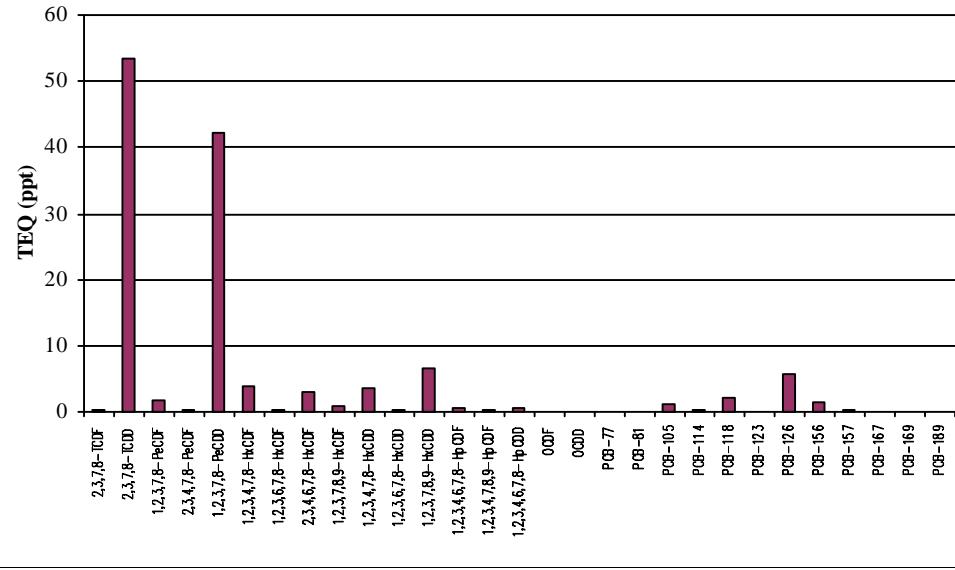
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

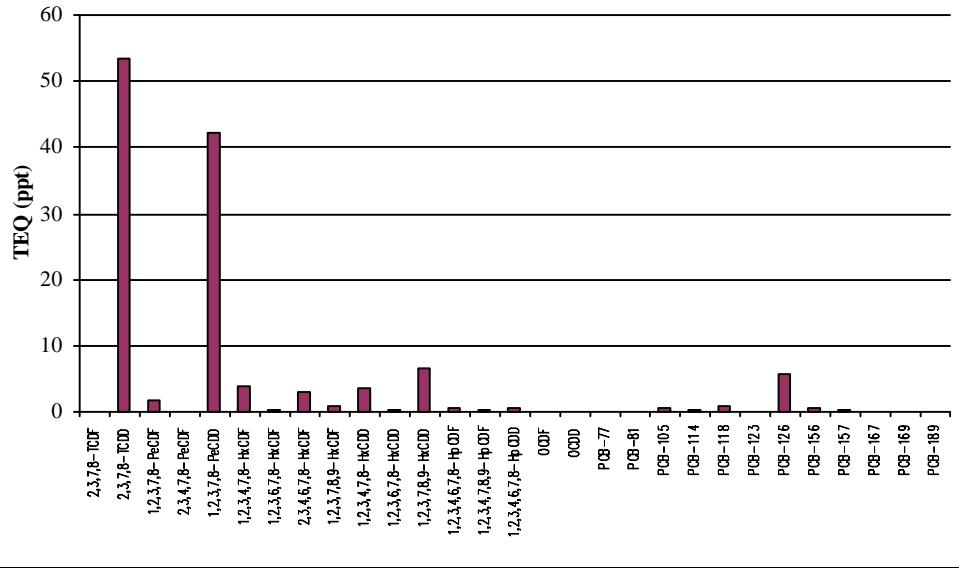
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

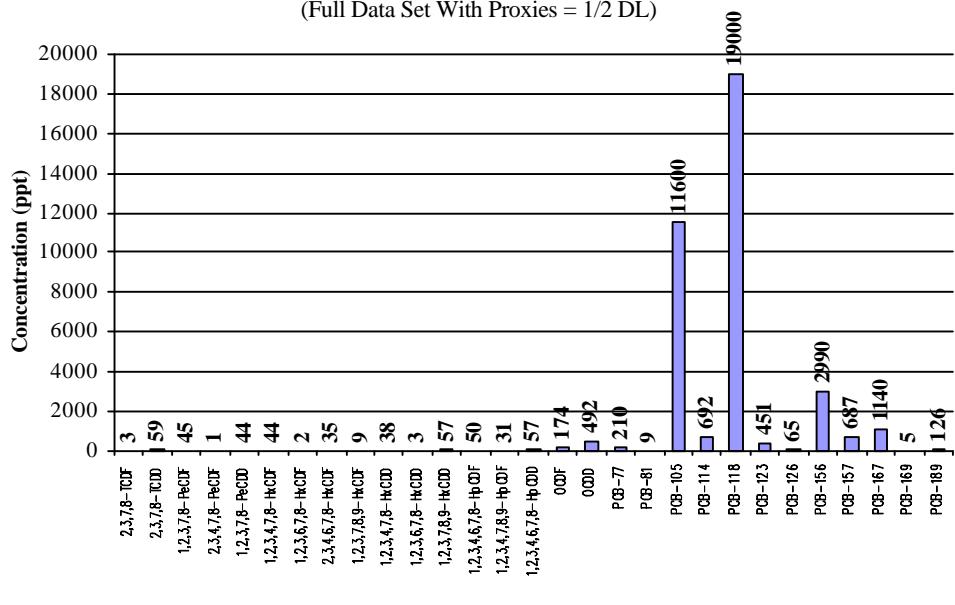


Appendix B4. Congener Profiles for QC Samples

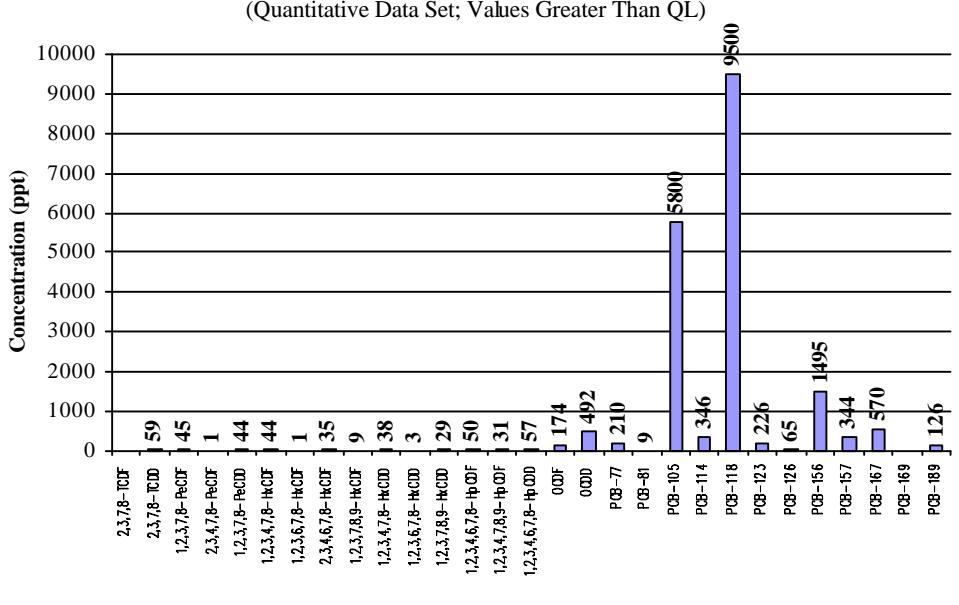
FINAL

Sample 351 PEM-F-12 PE Med Std**Full Concentrations: Congener Profile**

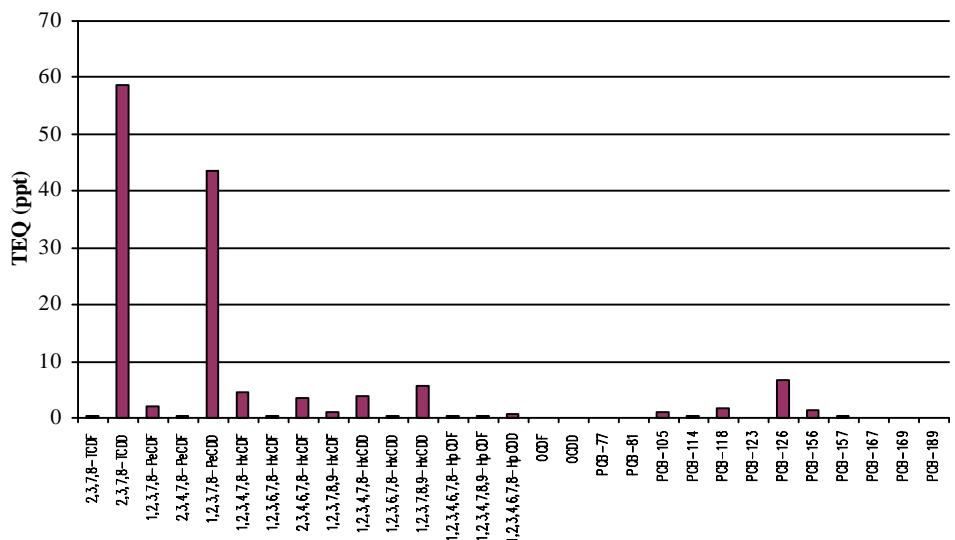
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

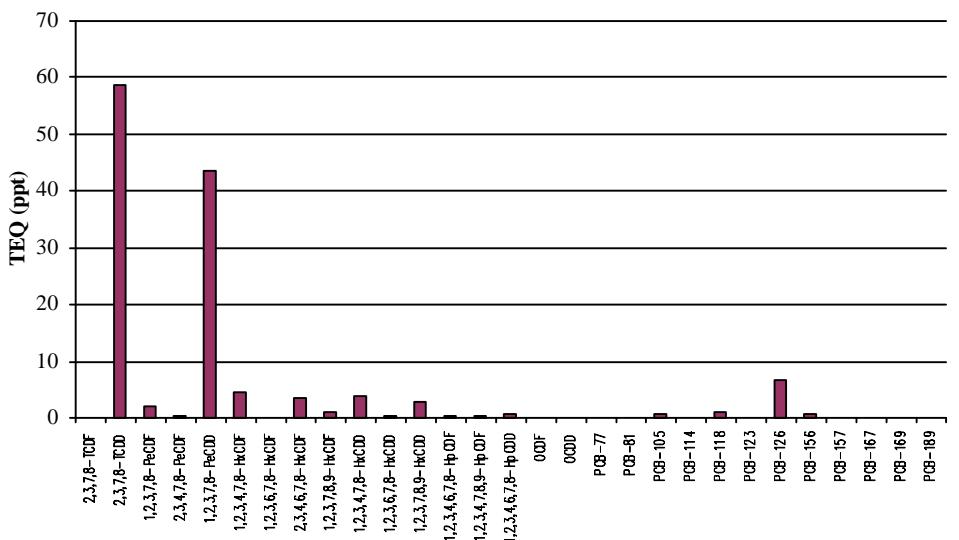
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

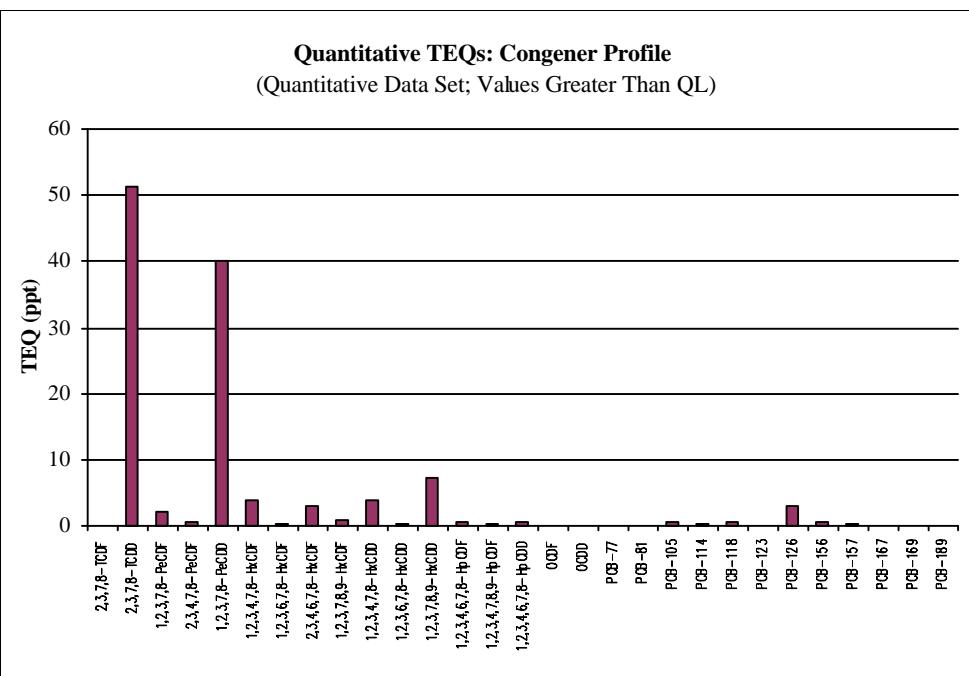
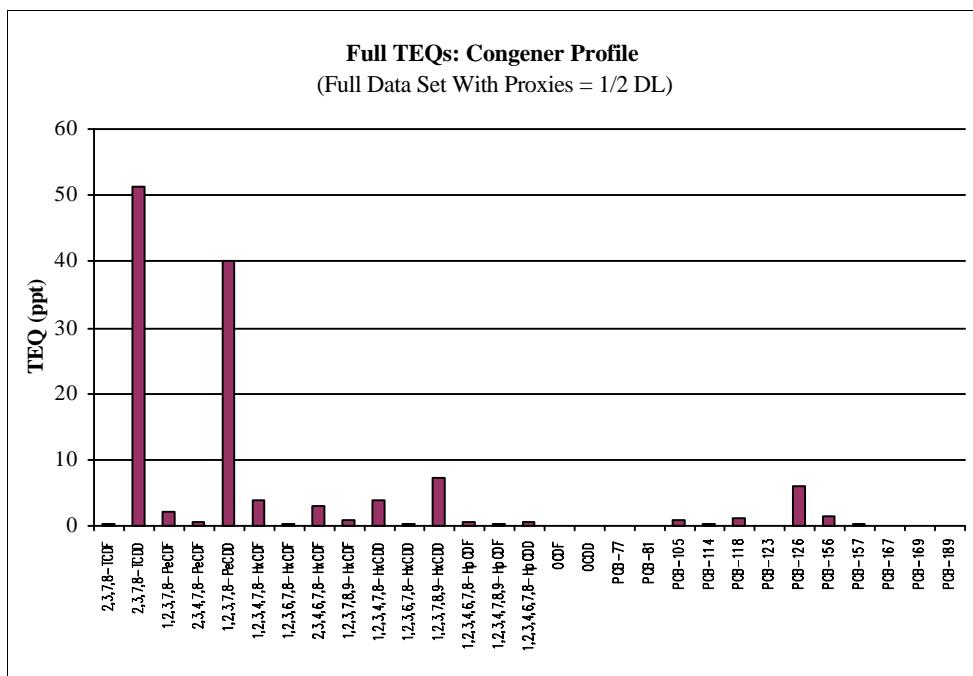
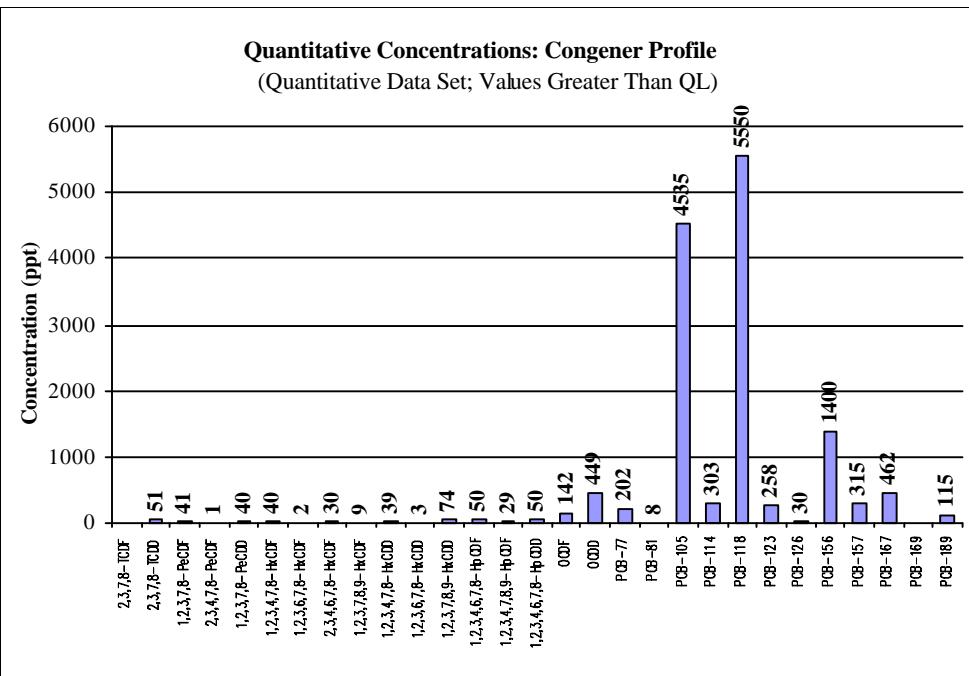
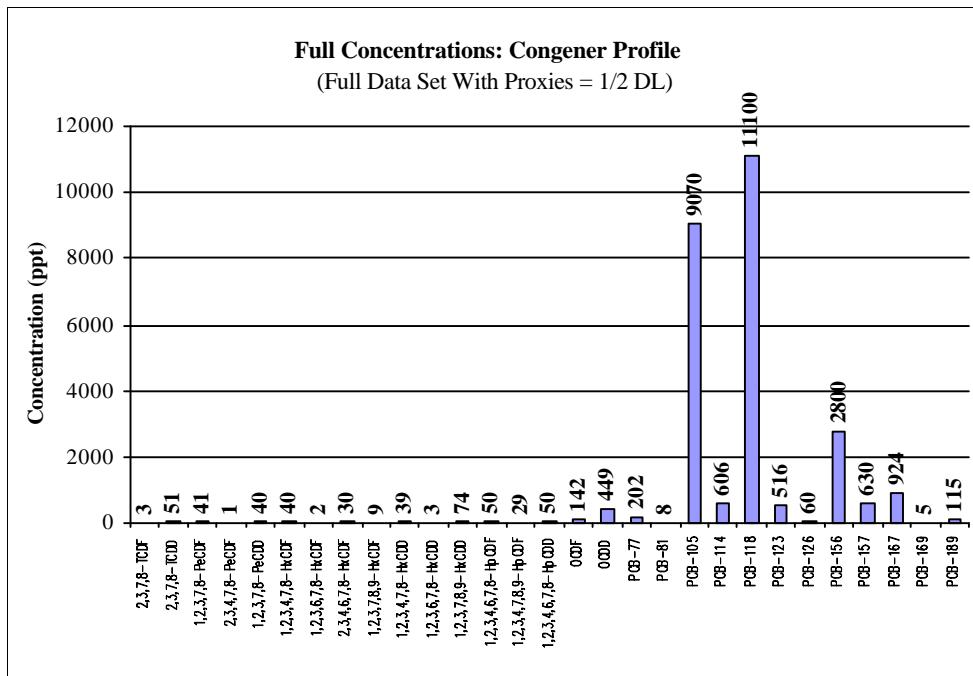
(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)



Sample 688 **PEM-F-11 PE Med Std**

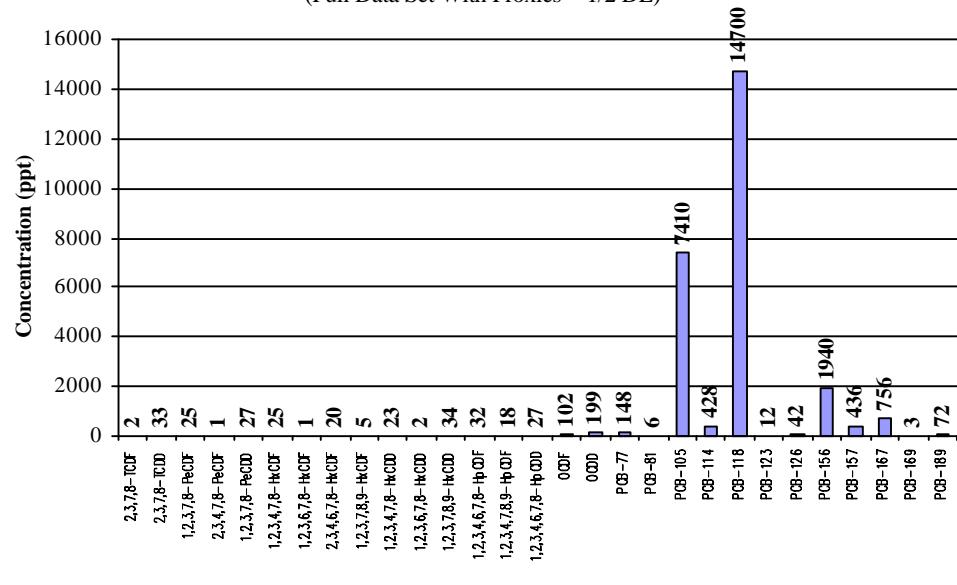


Appendix B4. Congener Profiles for QC Samples

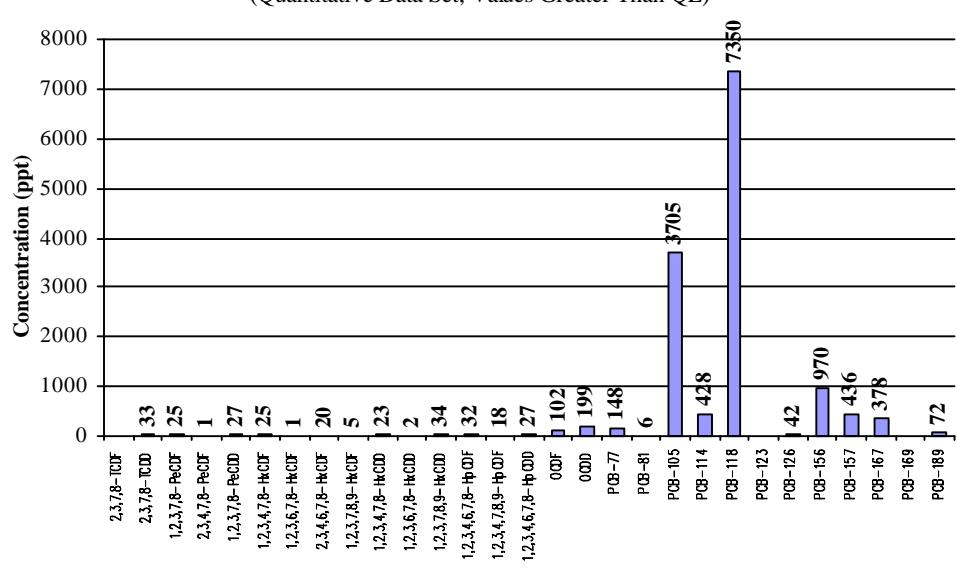
Sample *PC00807* *PEM* *PE Med Std*

Full Concentrations: Congener Profile

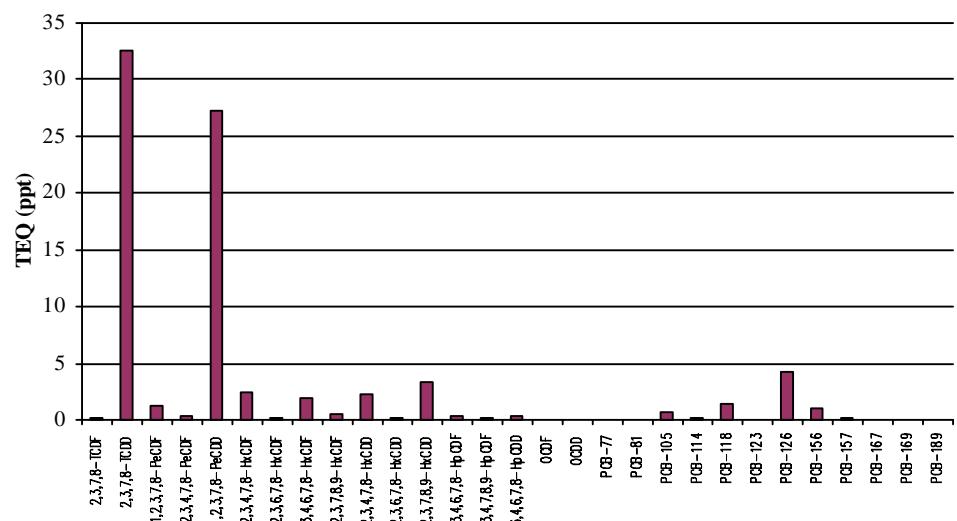
(Full Data Set With Proxies = 1/2 DL)

**Quantitative Concentrations: Congener Profile**

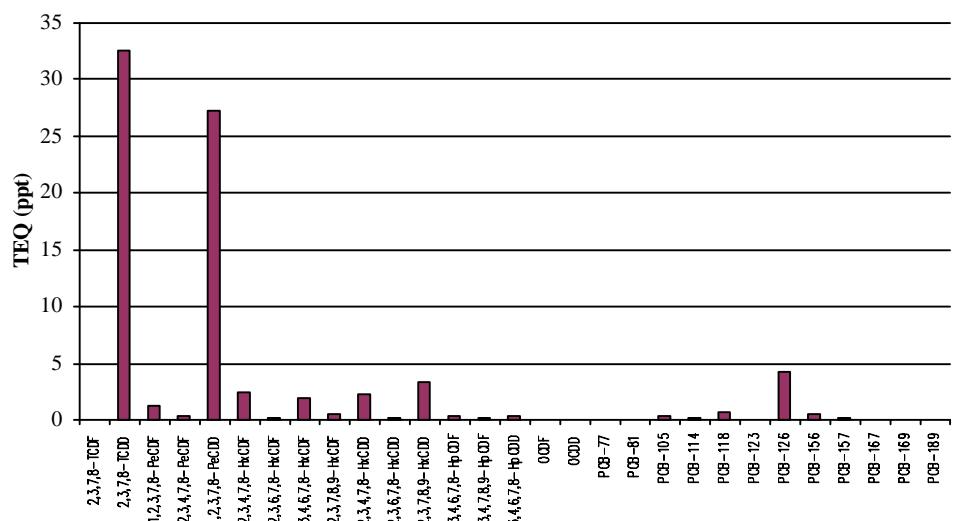
(Quantitative Data Set; Values Greater Than QL)

**Full TEQs: Congener Profile**

(Full Data Set With Proxies = 1/2 DL)

**Quantitative TEQs: Congener Profile**

(Quantitative Data Set; Values Greater Than QL)

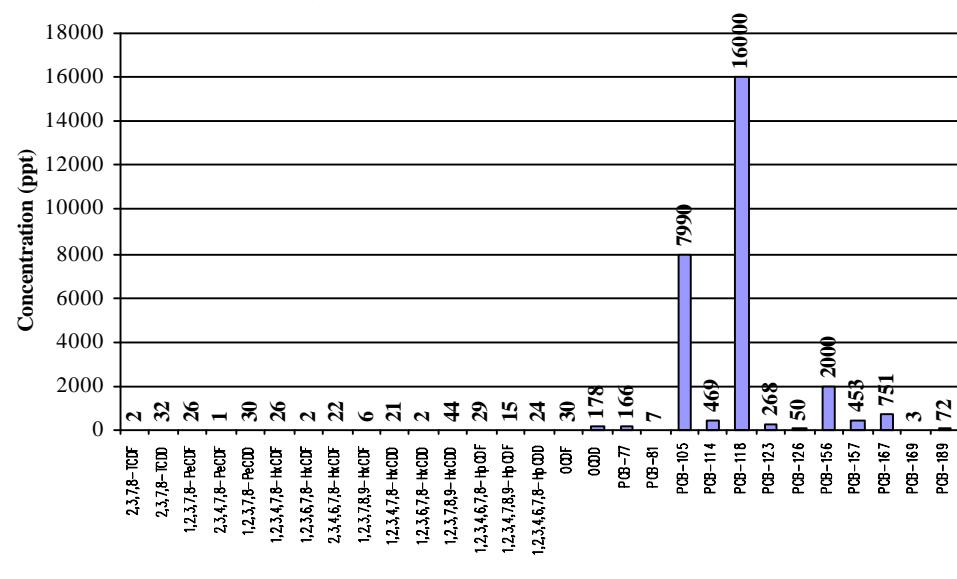


Appendix B4. Congener Profiles for QC Samples

Sample PC00820 PEM PE Med Std

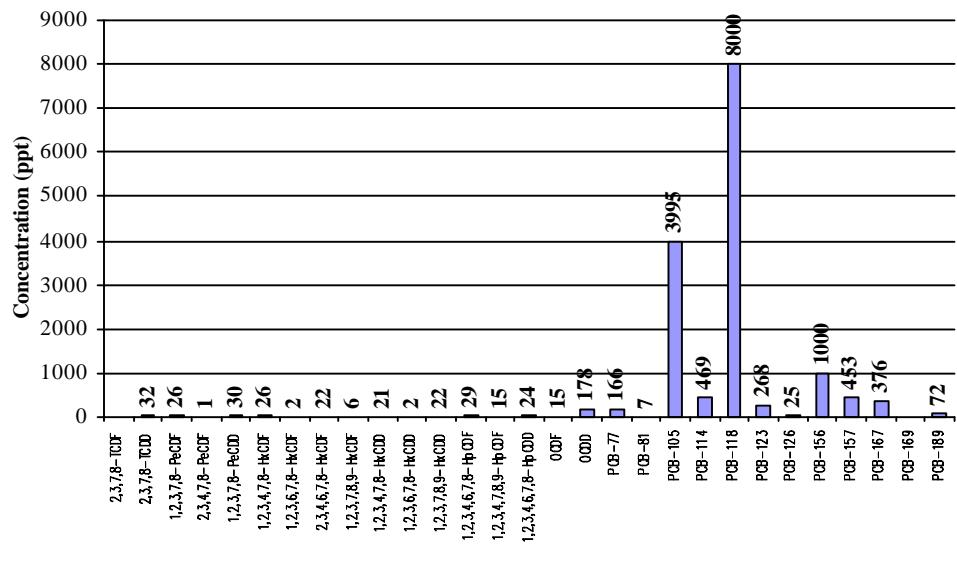
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



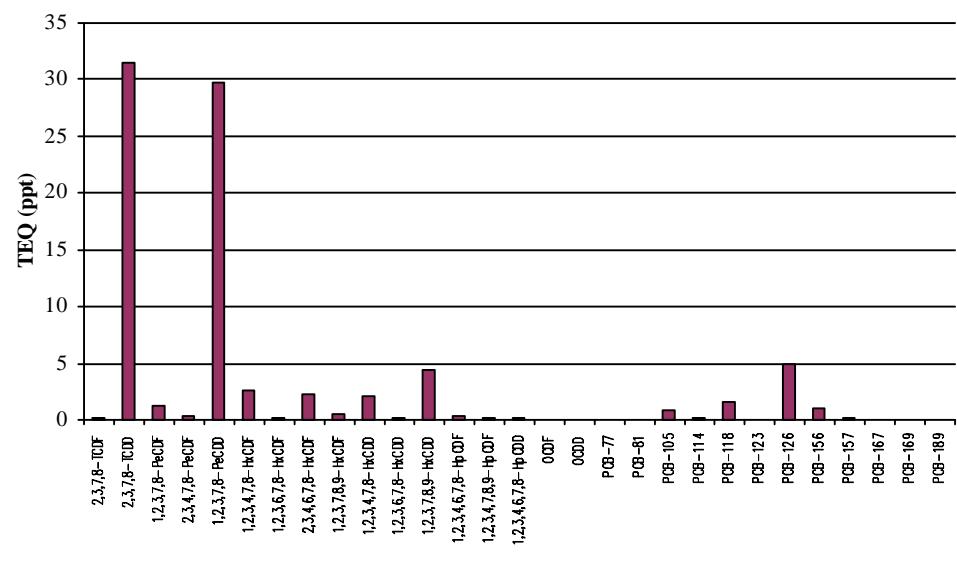
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



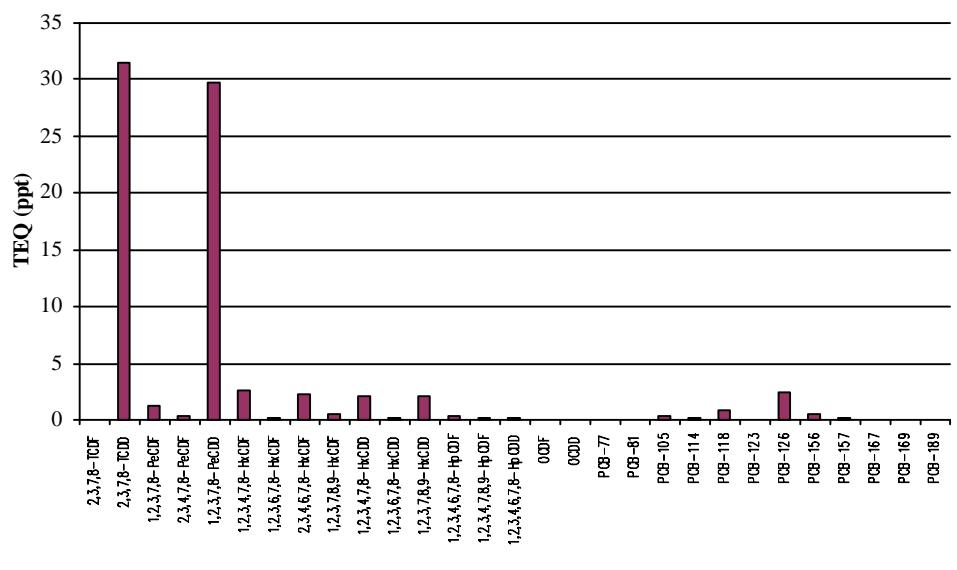
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



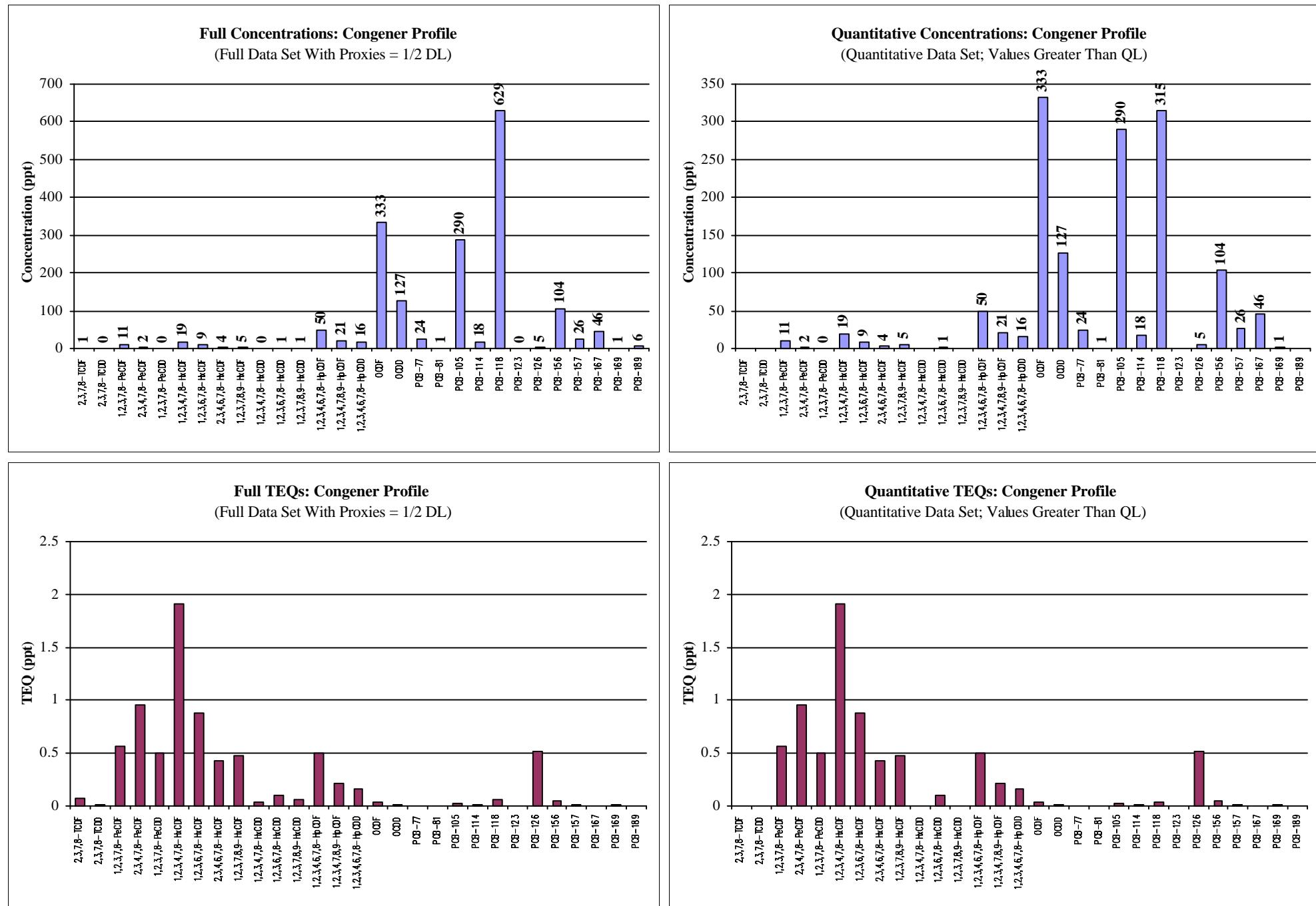
Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



Appendix B4. Congener Profiles for QC Samples

Sample 333 *S1* *Split*



Appendix B4. Congener Profiles for QC Samples

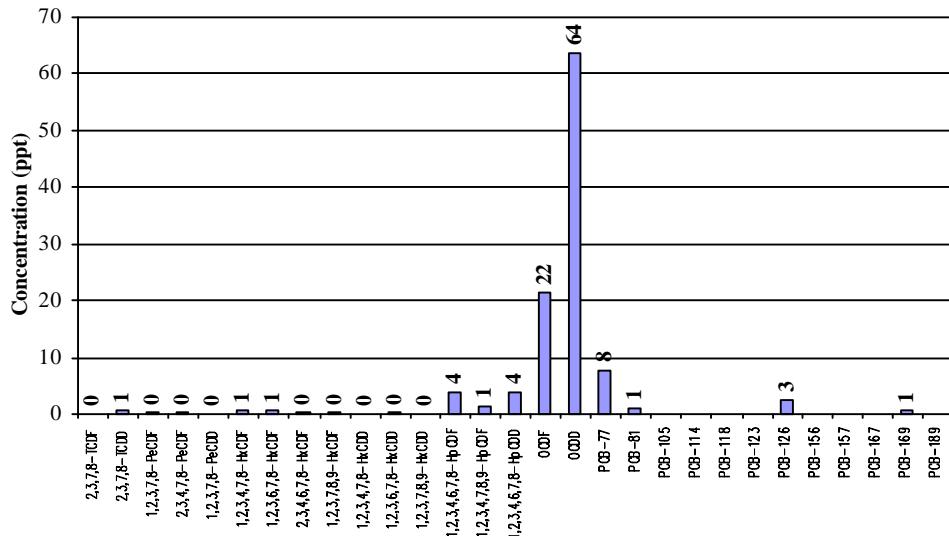
Sample 743

S5 Split

Several analytes not reported

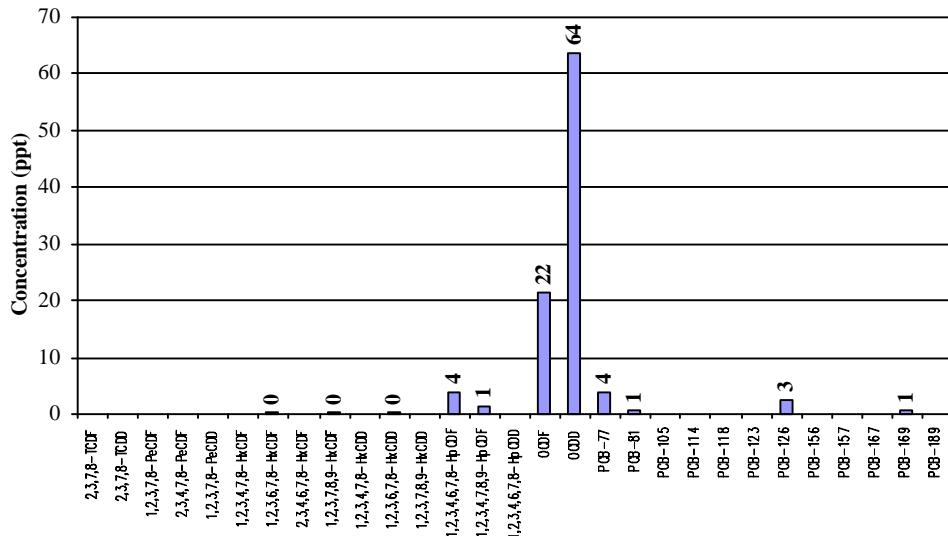
Full Concentrations: Congener Profile

(Full Data Set With Proxies = 1/2 DL)



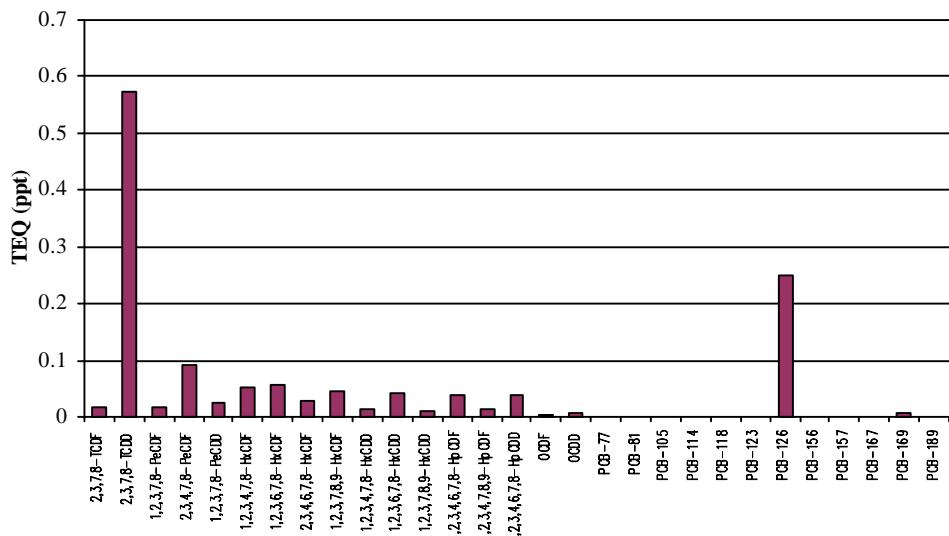
Quantitative Concentrations: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



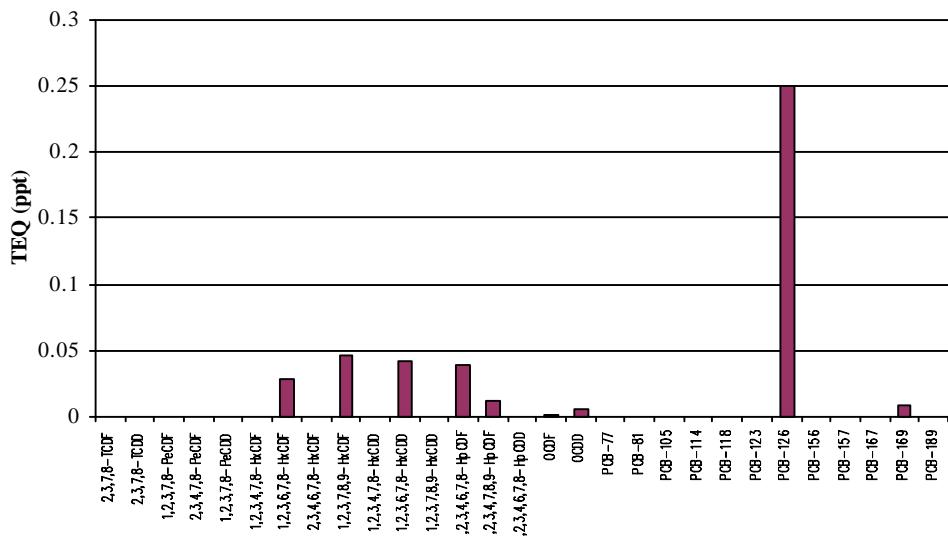
Full TEQs: Congener Profile

(Full Data Set With Proxies = 1/2 DL)

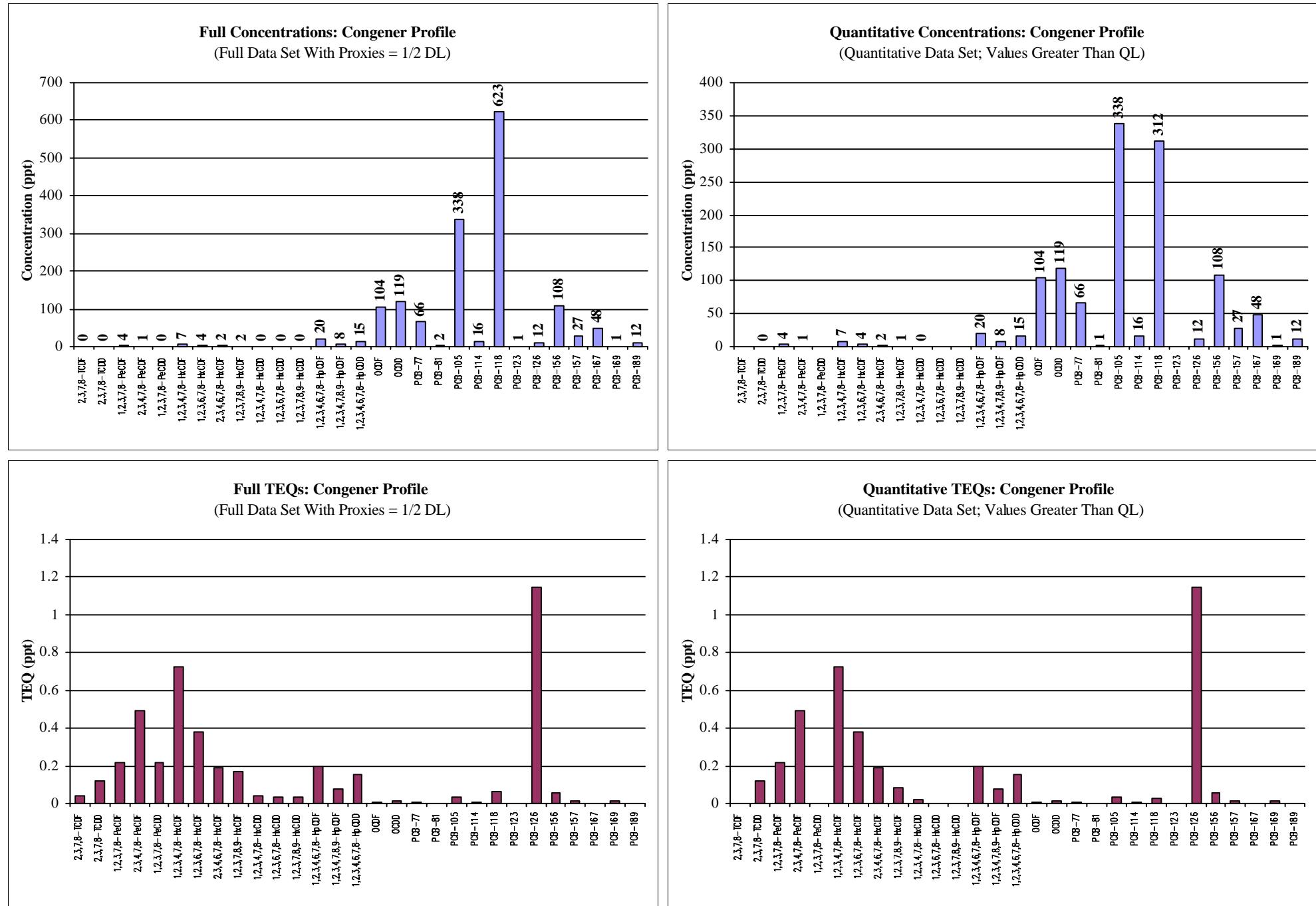


Quantitative TEQs: Congener Profile

(Quantitative Data Set; Values Greater Than QL)



Sample 874 S35 Split

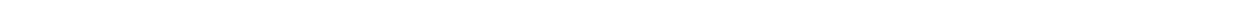


APPENDIX C

DETAILED SAMPLE LOCATION INFORMATION

PtName	Sample ID	Easting	Northing	Surveyor
SEC01	463	2187539.07	178957.11	Flatirons Surv 12-99
SEC02	429	2182021.96	179202.05	Flatirons Surv 12-99
SEC03	641	2177820.98	179878.02	Flatirons Surv 12-99
SEC04	102	2169371.03	176753.17	MorrisonKnudsen
SEC05	234	2198952.59	178135.39	MorrisonKnudsen
SEC06	830	2192335.03	179844.98	Flatirons Surv 12-99
SEC07	788	2191219.50	173448.93	MorrisonKnudsen
SEC08	589	2197936.12	170698.52	MorrisonKnudsen
SEC09	249	2172412.77	172547.45	MorrisonKnudsen
SEC11	318	2180655.65	174864.02	MorrisonKnudsen
SEC12	567	2186907.95	172782.65	MorrisonKnudsen
SEC19	187	2189238.07	194952.04	Flatirons Surv 12-99
SEC20	291	2194460.02	191888.03	Flatirons Surv 12-99
SEC22	644	2177768.88	194786.02	Flatirons Surv 12-99
SEC23	521	2179847.01	194886.07	Flatirons Surv 12-99
SEC24	385	2188314.99	191921.01	Flatirons Surv 12-99
SEC25	847	2188281.96	188609.07	Flatirons Surv 12-99
SEC26	547	2179122.57	187349.46	MorrisonKnudsen
SEC27	768	2175618.08	188746.13	MorrisonKnudsen
SEC28	264	2172503.22	189086.84	MorrisonKnudsen
SEC29	443	2197624.05	186501.07	Flatirons Surv 12-99
SEC30	736	2192385.10	188642.03	Flatirons Surv 12-99
SEC31	616	2190657.04	182057.64	MorrisonKnudsen
SEC32	945	2194542.90	184425.00	Flatirons Surv 12-99
SEC33	564	2171360.21	185361.68	MorrisonKnudsen
SEC34	693	2173521.43	183021.32	MorrisonKnudsen
SEC35	389	2182976.90	182003.00	Flatirons Surv 12-99
SEC36	991	2188286.06	184257.91	Flatirons Surv 12-99

APPENDIX D
MAPS OF TEQ RESULTS

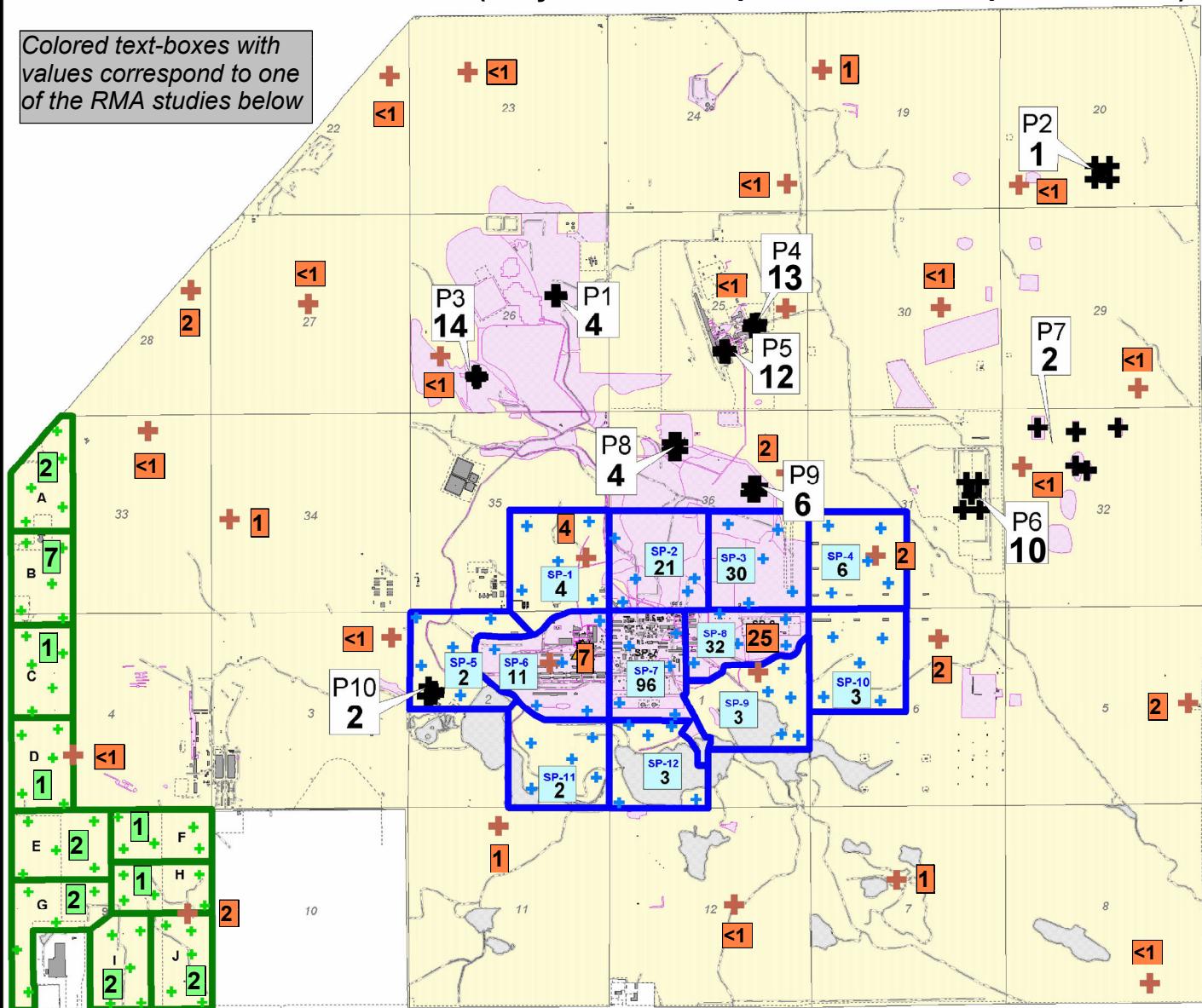


Results of Dioxin Concentrations (TEQ, ppt) in Soils at the RMA

June 2001

(+ symbols on map denote soil sample locations)

Colored text-boxes with values correspond to one of the RMA studies below



Study 3 - Western Tier Parcel

Study 4a - South Plants Sites

Study 2 - Random Grab Sites

Study 4b - Historic Use Sites

Study 1 - Off-post Random Study (data not shown here)



Gannett Fleming

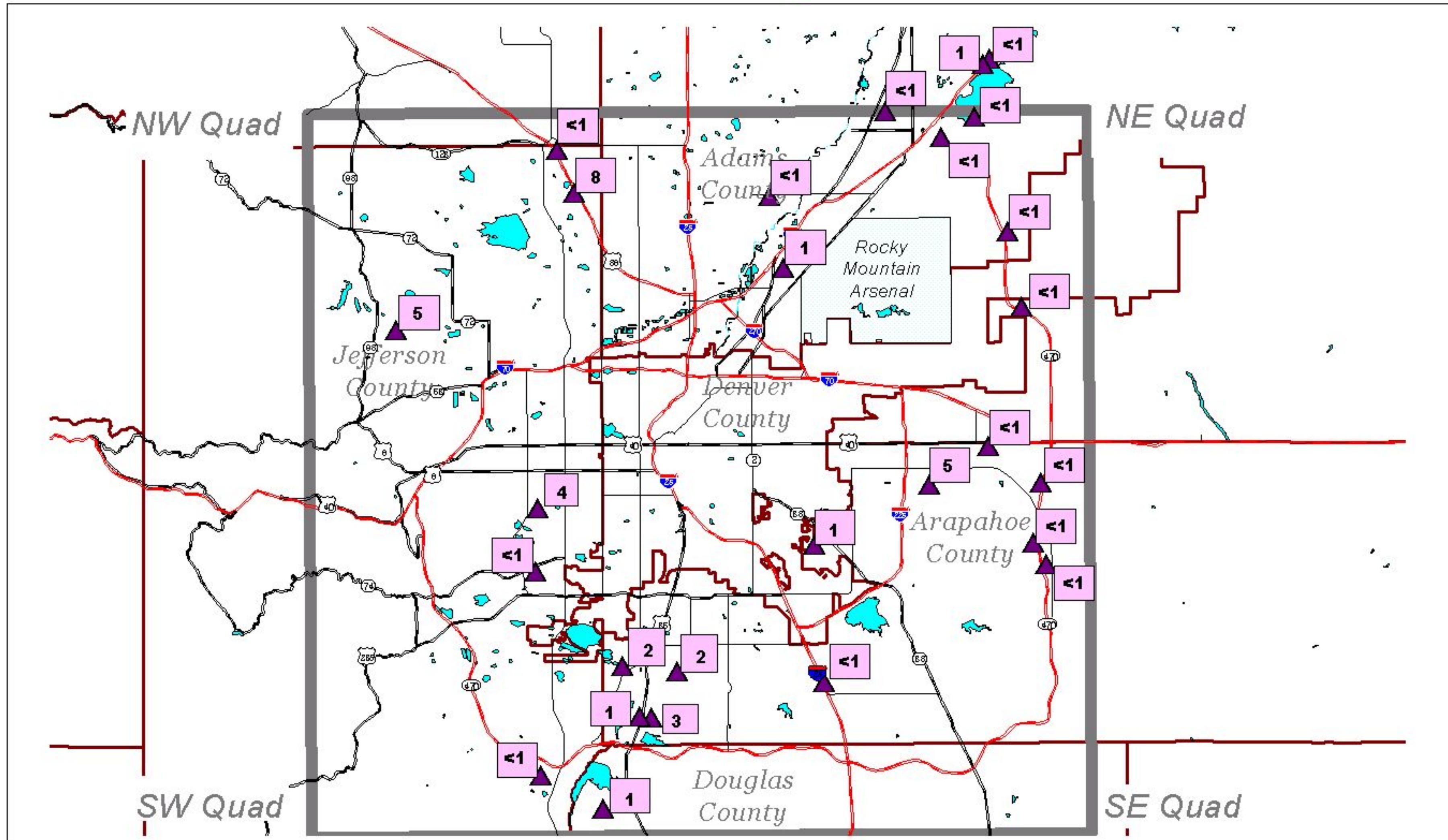
A horizontal bar divided into four equal segments. The first and third segments are black, while the second and fourth segments are white.

**ROCKY MOUNTAIN ARSENAL
CDPHE SAMPLE LOCATIONS
TOXICITY EQUIVALENT VALUES (ppt)
FROM COMPOSITE SOIL SAMPLES**

Map was modified to show all soil results at RMA, produced by Gerry Henningsen, USEPA R8

Results of Denver Front Range Dioxin Study (TEQ ppt)

Land Use - Agricultural



2 Toxicity Equivalent Values (ppt)

▲ Agricultural Sample Locations

Secondary Roads

Primary Road

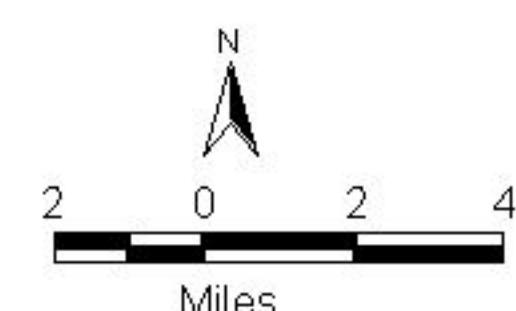
Primary Highways

Targeted Study Area

County

Lakes

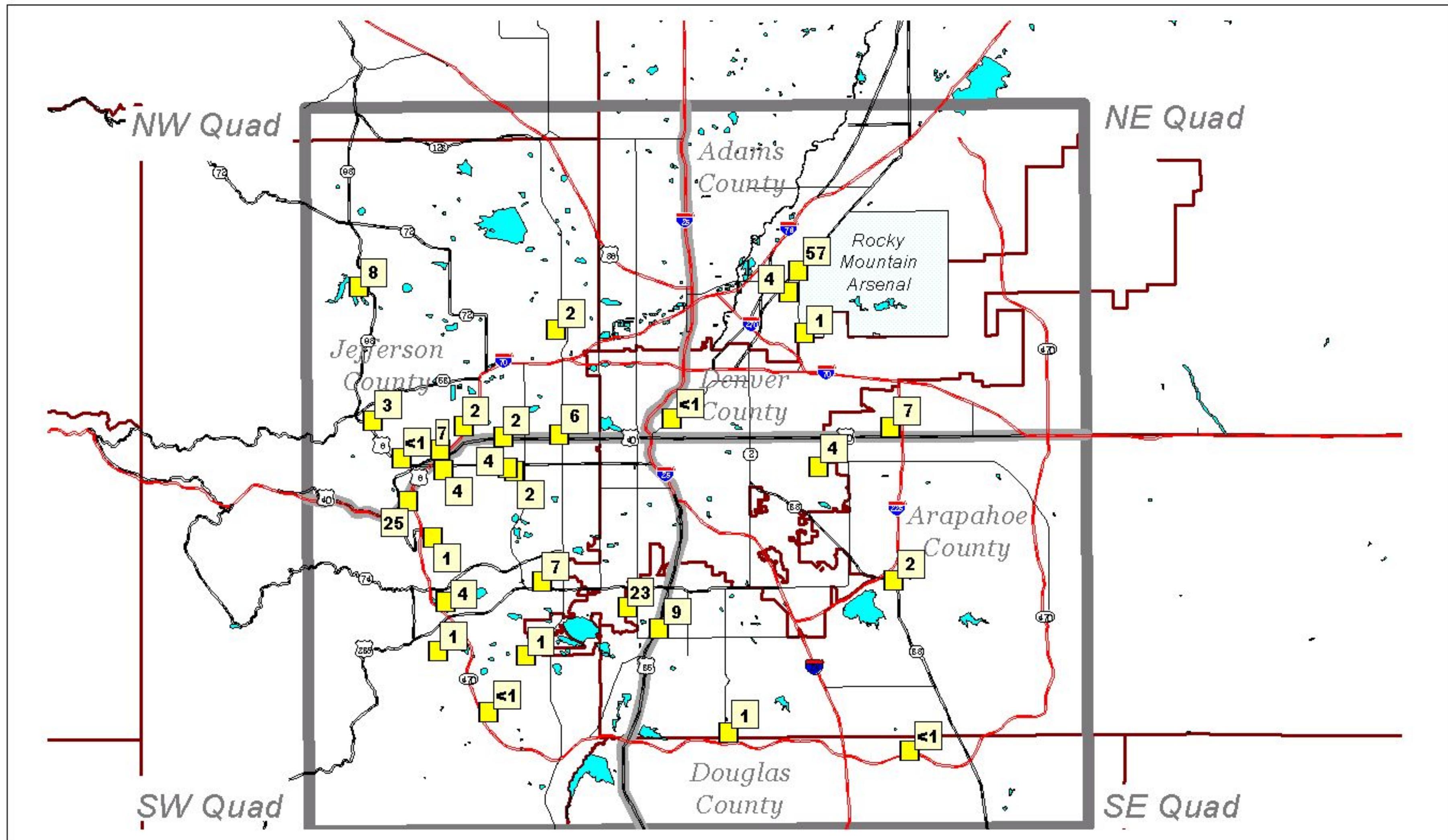
Rocky Mountain Arsenal



Gannett Fleming

Results of Denver Front Range Dioxin Study (TEQ ppt)

Land Use - Commercial



2 Toxicity Equilavent Values (ppt)

Commercial Sample Locations

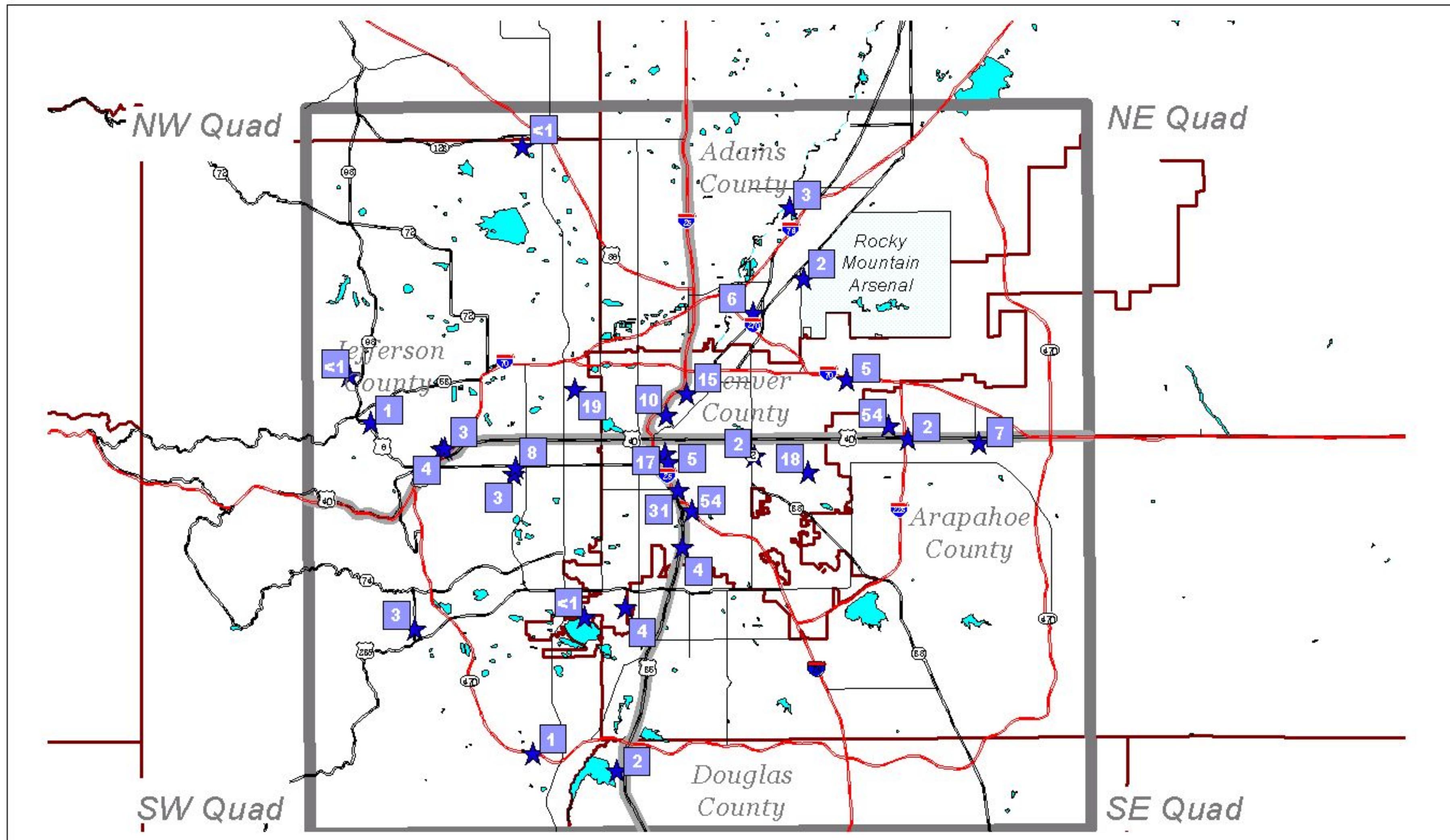
- Secondary Roads
- Primary Road
- Primary Highways

- Targeted Study Area
- County
- Lakes
- Rocky Mountain Arsen



Results of Denver Front Range Dioxin Study (TEQ ppt)

Land Use - Industrial



2 Toxicity Equivalent Values (ppt)

★ Industrial Sample Locations

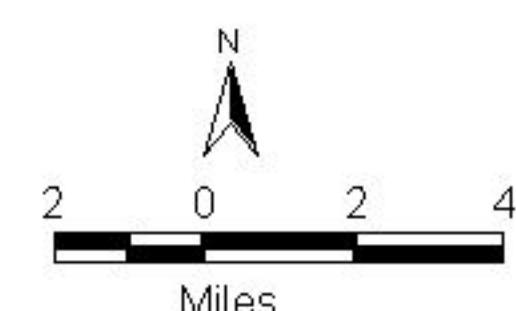
Secondary Roads
Primary Road
Primary Highways

Targeted Study Area

County

Lakes

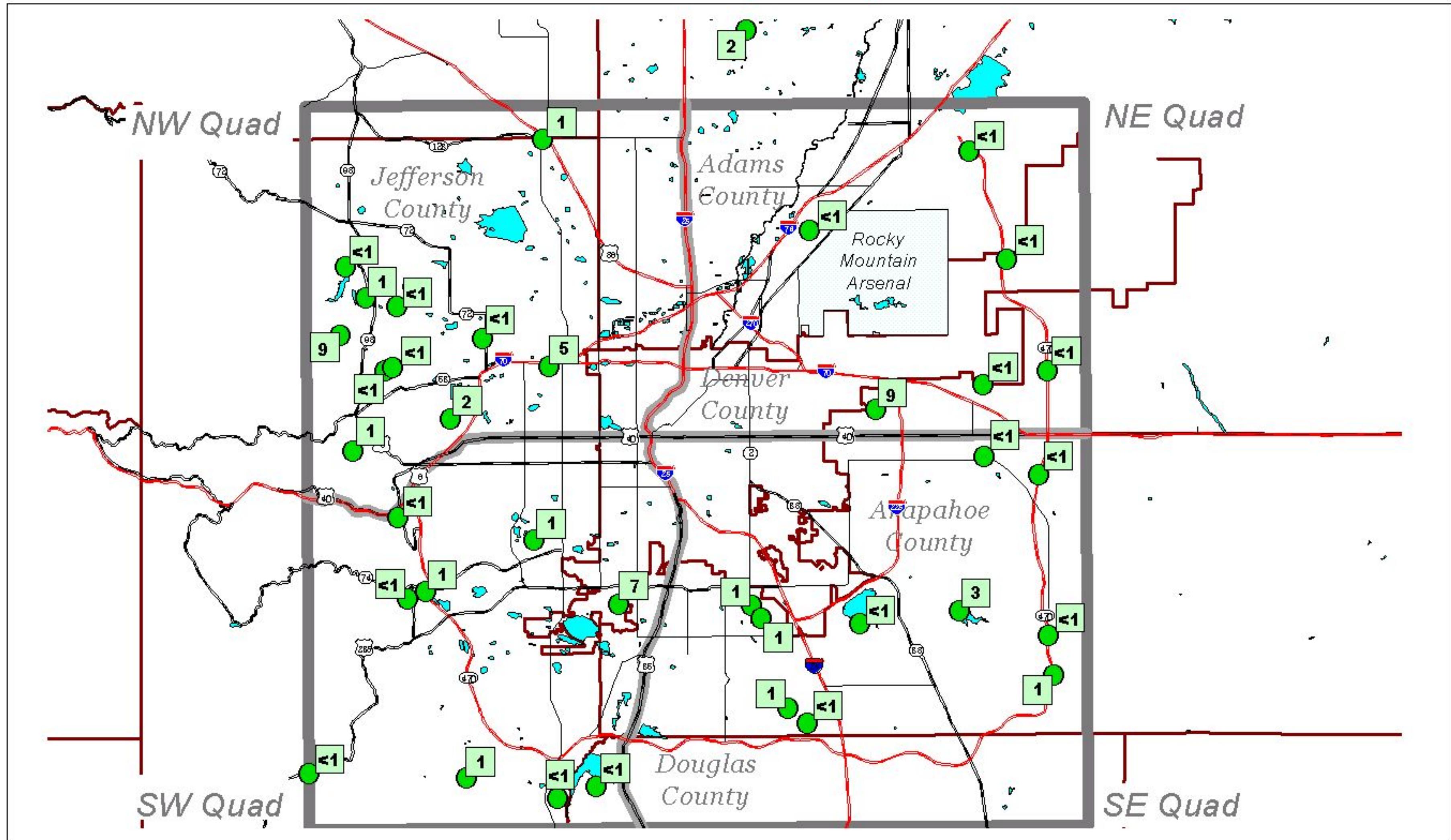
Rocky Mountain Arsenal



Gannett Fleming

Results of Denver Front Range Dioxin Study (TEQ ppt)

Land Use - Open Space



- 2 Toxicity Equivalent Values (ppt)
- Open Space Sample Locations

Targeted Study Area

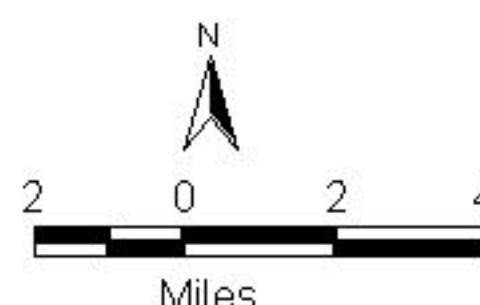
County

Lakes

 Rocky Mountain Arsenal

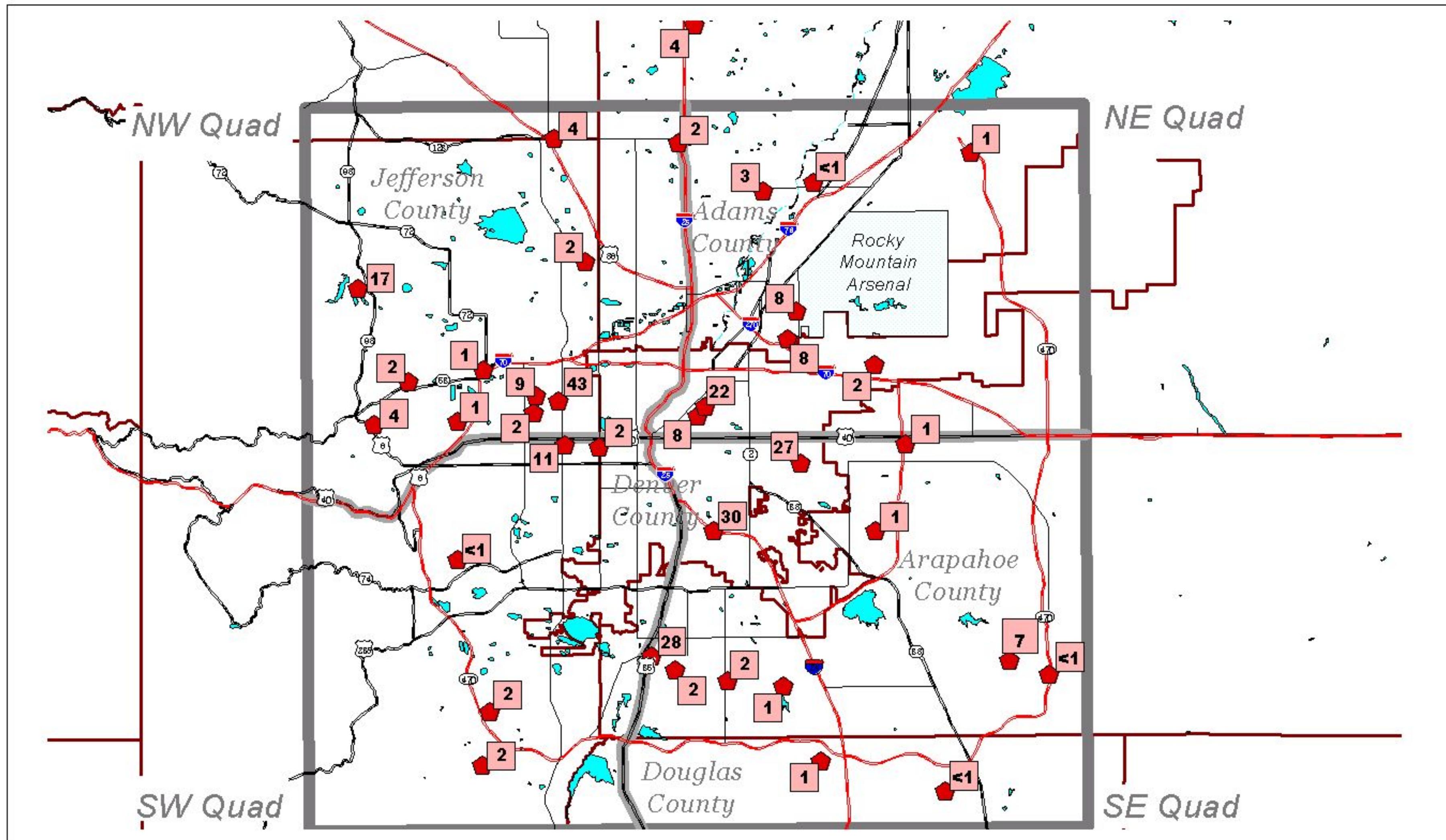


Gannett Fleming



Results of Denver Front Range Dioxin Study (TEQ ppt)

Land Use - Residential



2 Toxicity Equivalent Values (ppt)

 Residential Sample Locations

Secondary Roads

Primary Road

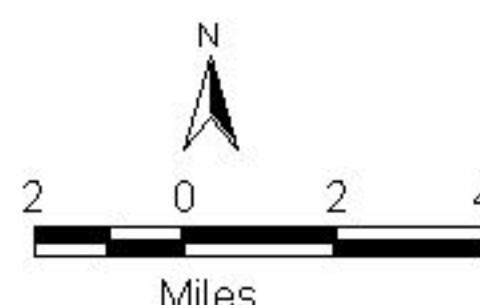
Primary Highways



County

Lakes

Rocky Mountain Arsenal



Gannett Fleming